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CUSTER NATIONAL FOREST

Final Environmental Impact Statement

FINAL ENVIRONMENTAL IMPACT STATEMENT

Custer National Forest
Land and Resource Management Plan

Type of Action:	Administrative
Responsible Federal Agency:	Forest Service, USDA
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Abstract: This Final Environmental Impact Statement describes the proposed action and other alternatives, including a "no action" alternative, for managing the land and resources of the Custer National Forest. The net land area involved is 2,445,798 acres.

The alternatives provide different mixes of management resulting in different levels of goods and services. The environmental consequences for the proposed action and other alternatives are displayed.

The opportunity to request an administrative review of an environmental impact statement and Forest Plan is limited by the National Forest Management Act regulations to those who participate in the process and to the issues they raise.

Comments regarding this statement should be sent to the Forest Supervisor, Custer National Forest, P.O. Box 2556, Billings, Montana 59103.

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APPENDICES

(These appendicies are in separate documents.)

A. Issues, Concerns, and Opportunity Identification Process
B. Description of the Analysis Process
C. Roadless Area Evaluation
D. Public Comments and Forest Replies
E. Threatened and Endangered Biological Evaluation

SUMMARY OF THE CUSTER NATIONAL FOREST FINAL ENVIRONMENTAL IMPACT STATEMENT

I. PURPOSE AND NEED FOR ACTION

A. Introduction

This Environmental Impact Statement (EIS) documents the analysis and discloses the significant environmental effects of a preferred alternative and other alternatives for the future management of land and resources of the Custer National Forest. The preferred alternative is the basis for the Proposed Forest Land and Resource Management Plan (Forest Plan) which is described in a separate document. This analysis and the Forest Plan are designed to ensure multiple use and to provide a sustained yield of goods and services from the Forest to maximize long-term net public benefits in an environmentaly sound manner. Net public benefits are the overall long-term value to the Nation of all outputs and positive effects (benefits), less all associated inputs and negative effects (costs), whether they can be quantitatively valued or not (36 CFR 219.3). Net public benefits include both priced and non-priced resource outputs, less all costs, produced under each alternative.

Development of this EIS and Forest Plan followed direction from a number of laws that describe the particular needs and concerns of the public and of Congress. The law giving the direction and requiring the development of the Planning Regulations was the the National Forest Management Act (NFMA) and the associated regulations for NFMA (36 CFR 219). The guidelines required by the National Environmental Protection Act (NEPA) were also followed. The analysis and Forest Plan will guide management of the Forest for the next 10 years unless conditions or demands significantly change. The plan will be revised on a 10-year, cycle or at least every 15 years (36 CFR 219.10).

B. National, Regional, and Forest Planning

The analysis and the resultant final Forest Plan will supersede all previous land and resource management plans prepared by the Forest. It is a direct link to National and regional planning. The National program, required by the Resources Planning Act (RPA), sets National direction and output levels for National Forest System lands. The share for each Forest is based on detailed information furnished by the Forest. Thus the Forest Plan includes direction provided by RPA, NFMA (including the implementing regulations), and the Regional Guide. This tiering process will continue as individual projects on the Forest follow the direction documented in the Forest Plan. Project activities not tiered to the Forest Plan will require additional NEPA analysis.

The EIS results from the first seven of ten planning actions required by NFMA (36 CFR 219). Planning records, the documents and files which chronicle the first eight planning steps, are available for inspection at the Forest Supervisor's Office, 2602 1st Avenue North, Billings, Montana. Reference is made to the planning records in both documents named above. Refer to Appendices A and B for a detailed description of the process used in planning actions 1, 3, 4, 5, and 6.

The public and governmental agencies were asked to comment on the Draft EIS and Proposed Forest Plan. Comments received were used to examine the results of the first seven planning steps and to modify, the Forest Plan. This Final EIS and Forest Plan were then used by the Regional Forester as the information base for a record of decision. The remaining planning steps are, namely:

9. Plan implementation
10. Monitoring and evaluation.

C. Planning Area

The Forest is located in three States: Montana, North Dakota, and South Dakota. As shown in Figure I-1, there are many parcels comprising the Custer National Forest, and National Forest System lands fall in 20 counties. There are three National Forest Ranger Districts and four National Grassland Ranger Districts, containing four separate National Grasslands.

National Forest Proclaimed lands	1,185,680 acres
National Grasslands	1,260,118 acres
Non-Federal Within Boundaries	1,552,958 acres
Gross Area	3,998,756 acres
Net National Forest System lands	2,445,798 acres

Private and other government landholdings are intermingled throughout the entire Forest, making up the 1,552,958 acres or 39 percent difference between the gross and net acreages. Distances across the Forest are 640 miles east to west and 240 north to south. Elevation ranges from 905 feet above sea level to 12,799 feet above sea level.

The Absaroka-Beartooth Wilderness, covering 339,841 acres on the Custer National Forest, comprises 14 percent of the net acreage of the Forest's land base. The remaining acres of this Wilderness, about 575,000, are administered by the Gallatin National Forest. The management of the Custer portion is addressed in this Forest Plan. In addition, roadless lands cover about 258,280 acres on the Forest, involving 120,400 acres in North Dakota and 137,880 acres in Montana. Several roadless areas overlap onto other Forests, either the Gallatin National Forest or the Shoshone National Forest in Wyoming. There are

no Montana Wilderness Act areas on the Forest, but three areas, Tongue River Breaks, Lost Water Canyon, and Twin Buttes, had been previously recommended for wilderness classification. All roadless areas except the Tongue River Breaks are evaluated for wilderness designation. This area was released from wilderness evaluation in the Lee Metcalf Wilderness and Management Act of 1983. Appendix C contains information on each roadless area. Alternatives for management of all of the roadless areas on the Custer National Forest are addressed in the FEIS. Recommendations for additions to the wilderness system will be included in a separate report and record of decision transmitted by the administration to Congress.

A unique feature of Custer NF is its proximity to seven Indian Reservations. There are three in Montana, two in North Dakota, two in South Dakota, and one that falls in both North and South Dakota.

D. Issues, Concerns, and Opportunities

Public issues, management concerns and the range of opportunities for management were identified early in the planning process. Identification of these components expressed what benefits people want in terms of goods, services, uses, and environmental conditions. See Appendix A for a detailed discussion of public issue development.

The Forest started public involvement for Forest Planning in May of 1981 and the input in these responses, plus information from Grazing Associations and other Forest users, was used to develop the five planning questions.

Additional public involvement was initiated in September 1983, to aid in resolution of the roadless allocation question. As a result of the Ninth Circuit Court decision on the RARE II EIS (1982), the Forest is now including an evaluation of roadless areas for wilderness designation in the Forest planning process. The Forest had relied on earlier evaluations and recommendations made in the RARE II (Roadless Area Review and Evaluation) Final EIS.

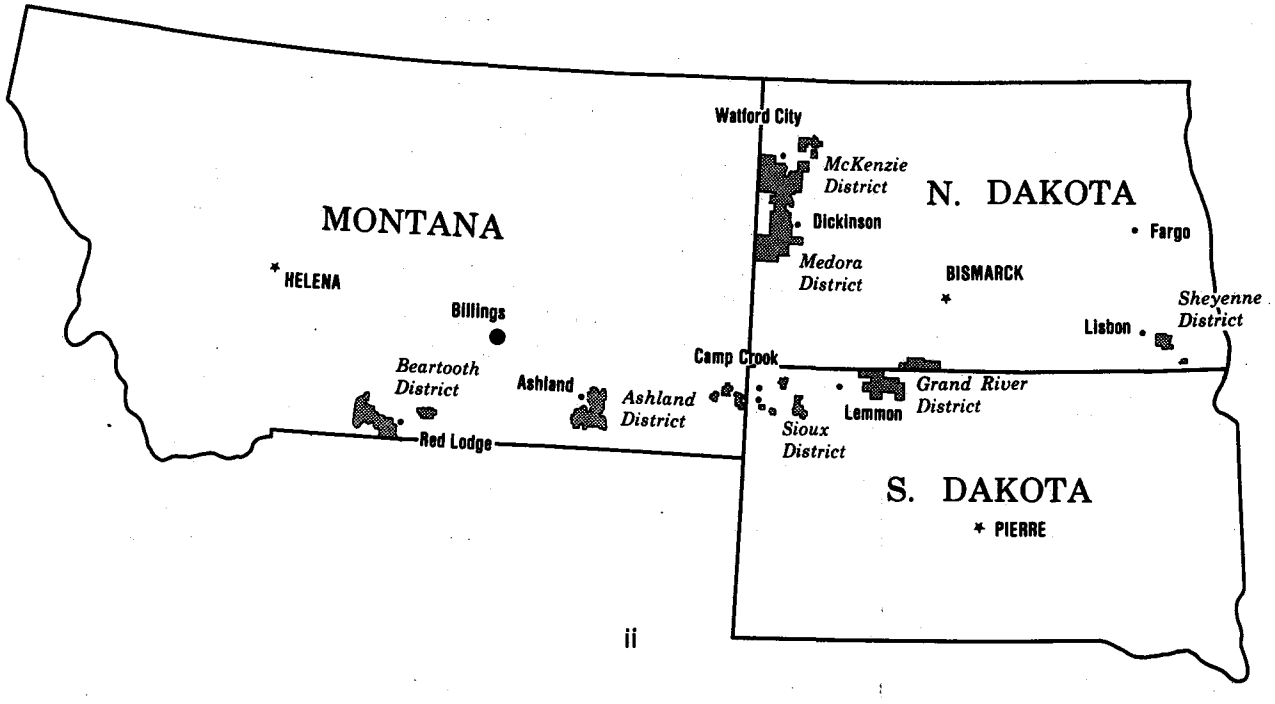
Public responses to the five planning questions were received and analyzed. These five planning questions are listed below. The environmental effects of possible solutions to these questions are analyzed in the FEIS in order to provide appropriate and effective management direction for the Forest.

ICO 1 (Issue, Concern, Opportunity):

At what level of use and management intensity should livestock be managed on the Forest, considering public needs and demands for all resources?

FIGURE S-1
VICINITY MAP

Custer National Forest Ranger Districts



ICO 2:

In response to National demands for energy and strategic minerals, how can the Forest provide for mineral exploration and development while also providing for renewable resources?

ICO 3:

How and where will the resource base, including riparian (stream-bank) zones and woody draws, be managed and protected for wildlife in view of competition from other resources?

ICO 4:

What are the long-term public and resource management access needs and how should they be resolved?

ICO 5:

What is the long-range need for low development areas and how should they be managed?

The management concerns are listed below:

ICO 6:

Certain timber volumes from the forested Districts are needed to ensure a reasonable flow to the industry and for the enhancement of range and wildlife habitat.

ICO 7:

Recreation opportunity needs to be evaluated across the Forest. Many rural areas depend nearly entirely upon Forest Service facilities and National Forest System lands for public use. Conversely, recreation facilities and public lands near metropolitan areas are also integral in total public recreation opportunity.

ICO 8:

Scenic beauty of the lands under the Forest's management is an important concern. Existing Visual Condition is used to monitor the upper limits of negative disturbance to the landscape. It is the goal of any management theme to maintain the natural character and beauty of the lands as a response to public expectations and administrative policy.

ICO 9:

The assessment of the total net public benefit is vital to the selection of the Preferred Alternative. This value includes all returns to society from the Forest, including priced and non-priced goods and services, employment and social programs.

ICO 10:

The required budget for each alternative in comparison to realistic expectations for Congressional actions are probably most critical to the success of the Preferred Alternative.

During the public input period to the Draft EIS the Forest received about 1,000 comments on the Draft plan. An analysis of this input is included in Chapter VI of this document. Individual responses to these letters are included in Appendix D.

The Record of Decision is a separate document that discusses the decisions and the rationale for these decisions.

II. ALTERNATIVES

This chapter presents the development, description and comparisons of alternative ways of managing the Forest's land and resources. The development process involves an analysis of the management situation, which includes a determination of minimum and maximum resource and value potentials. These minimums and maximums are called Benchmarks, and 10 were evaluated. The names of the benchmarks are as follow:

Maximum Present Net Value
Maximum Timber
Maximum Deer Habitat
Maximum Livestock Forage
Maximum Recreation
Maximum Wilderness
Maximum Oil Production
Maximum Market
Minimum Level
Current Direction

These benchmarks aided in the development of the alternatives, particularly by showing the upper and lower bounds of resource production and the apparent conflicts of managing certain resources on the same area of land. In response to Regional Forester's direction, June 7, 1983, an adequate range of alternatives was developed. The Forest built upon these guidelines and analyzed a total of 16 alternatives. Selected outputs for period one of these alternatives are displayed at the end of this section. These alternatives are briefly described below:

A. Alternative 1

The objective of this alternative is to analyze the effects of emphasizing wildlife management and maintaining a high level of roadless areas. Valuable wildlife habitat and roadless areas would be of prime consideration. As many acres as possible from the inventoried roadless areas would be designated for roadless management. Other resource outputs and responses would be left unconstrained, priced values would not emphasized, but produced in response to these other resource needs.

Approximately 1,333,000 acres would be designated to wildlife emphasis, and within this designation would be about 152,000 acres of woody draws and riparian areas. This alternative would provide the greatest amount of wildlife emphasis to alleviate the livestock impacts to these vital wildlife habitat areas. The designation of 116,788

acres (45 percent of the inventoried roadless resource) to roadless status and 129,000 acres to wilderness classification would also offer much land and habitat protection. Wildlife-related recreation visitor days that include the hunting, fishing, and nature study activities would increase from approximately 164,000 to slightly over 500,000 by the fifth decade. The developed recreation facilities would be maintained as long as the use does not interfere with important wildlife habitat. A wide variety of dispersed recreation opportunities would be available, particularly hunting big game and upland birds and warm and cold water fishing.

Livestock grazing would be reduced to 827,000 AUM's immediately from the current 875,000 and would further be reduced in fifty years to 728,000 AUM's. Oil production would be at the one of the lowest level of all the alternatives, approximately 302 million barrels accumulative. Mineral exploration and production activities in the key wildlife habitat and roadless areas would be restricted to no surface occupancy or other special lease stipulations. A moderate level of timber harvest (3.5 MMBF) would be scheduled annually during the first decade because of the forage, browse and hiding cover that harvested openings can provide for deer. This alternative would not create additional Forest access. Total road miles would increase by 644 during the first decade of this alternative, primarily for timber harvest and oil and gas exploration and development within the Forest.

During the first decade, yearly average budget would be $7,100,000.

B. Alternative 2 (RPA)

The objective of this alternative is to meet the direction in the "Revised President's Statement of Policy," which states that "at least one alternative in the DEIS will be developed to determine how the 1980 Forest and Rangeland Renewable Resources Planning Act (RPA) program could best be implemented on the Forest." The Forest's projected program outputs, activities, and costs are assigned through the Northern Region Guide in response to National demand. As such, this alternative would explore the production compatibility among resources with RPA projections in timber, minerals, range, and recreation. The livestock grazing animal unit months (AUM) assignment from RPA cannot be met after the year 2020 because it exceeds the land's capability, although the levels increases from the current 875,000 to 973,000 by the fifth decade. Oil production would be at a high level, approximately 345 million cumulative barrels, ranking highest with Alternative 3. The RPA assignment for timber harvest is low in the first decade and the projections could be met, starting at at 2.2 MMBF and reaching 8.8 MMBF by the fifth decade. Access to and within the Forest would increase in this alternative because of the emphasis to meet the RPA production assignments, particularly timber. Roading would increase about 1,880 miles in the first decade.

Because of the emphasis of meeting the RPA assignments and other resource needs, particularly the range program, wildlife management would be emphasized on those areas that would not be important to these other resources. Slightly over 125,000 acres would be designated to wildlife emphasis in response to the habitat improvement projections in RPA. Approximately 128,600 acres or 50 percent of the inventoried roadless resource would be retained. Only 300 acres would be recommended for wilderness classification. The developed recreation facilities such as campgrounds and picnic grounds would receive maintenance and a regular season of use, about 3 months, would be provided. One new facility, a canoe landing on the Sheyenne Ranger District, would be constructed. RPA projections for dispersed recreation including wildlife-related activities would be reached without any major construction.

Yearly average budget for the first decade would be $6,800,000.

C. Alternative 3

The objective of this alternative is to determine the level of goods and services that result from maximizing the Present Net Value. To ensure feasibility and reasonable distribution of activities and outputs across the Forest, certain levels of the timber and range outputs were specified. These were the only constraints. By using the maximum PNV objective function in the FORPLAN model, the results of the analysis showed the best way to achieve this alternative.

Grazing levels would be very close to existing levels and would be expected to meet local demand for livestock forage for the planning horizon, increasing to 898,000 AUM's by the fifth decade. This alternative would produce the highest level of oil along with Alternative 2, reaching 345 million barrels of oil. The harvest level would begin at 4.4 MMBF and reach 6.0 MMBF by the fifth decade. The programs in this alternative would require about 1,880 miles of additional roads.

Over 373,000 acres would be designated to wildlife management in this alternative. Approximately 119,100 acres or 45 percent of the inventoried roadless resource would be retained. No additional lands would be recommended for wilderness. The developed recreation sites on the Beartooth Ranger District would be well-maintained to attract more use and all would remain open for the regular season, about 3

months. A few new sites would be constructed on the Ashland Ranger District.

During the first decade, yearly average budget would be $6,190,000.

D. Alternative 4

The objective of this alternative is to emphasize wilderness and recreation. All inventoried roadless areas would be recommended for wilderness classification. Because fewer recreation visitor days are derived from wilderness use (less concentration of people than in other dispersed activities), desired recreation visitor days would be adjusted downward so that wilderness recommendations could be met. The other outputs would be left unconstrained. Production of priced goods would continue, but only in response to these non-priced outputs.

Recommended wilderness acreage would total 241,700 and approximately 16,600 acres or 6 percent of the inventoried roadless resource would be retained. The developed recreation facilities, such as campgrounds and picnic grounds, would be maintained so that deterioration would not occur and to encourage use, consistent with the objective of the alternative. Use at these facilties would be expected to increase through time. Dispersed recreation, including wildlife-related activities, would increase at a moderate level and would reflect the designation of over 327,000 acres to wildlife emphasis.

Grazing would occur at a fairly even level, 898,000 AUM's. Wilderness designations preclude new oil and gas leasing and subsequent development, therefore the production levels would be very low, 315 million cumulative barrels, second only to the lowest production in Alternative 1. Road building, oil and range developments, and livestock utilization would not generally occur in the wilderness areas. The timber harvest level in this alternative would be 3.4 MMBF in the first decade, increasing to 7.6MMBF during the second decade. Road mileage needed for this program and other oil and gas activities would increase by 648 miles across the Forest. This would not enhance the opportunity for greater access to or within the Forest.

The first decade of this alternative would require an annual budget of $7,100,000.

E. Alternative 5

The objective of this alternative is to continue the current level of outputs provided by existing unit plans, multiple-use plans, and long-range Forest goals and objectives. Unit plans exist for all Districts of the Custer National Forest except the Grand River Ranger District which has a multiple-use plan. To formulate this alternative, resource outputs defined in unit plans had to be achieved. The budget to achieve these outputs was not constrained. The 10-year timber program was defined and certain areas to be retained as roadless were identified.

The grazing would stay at the current level, about 875,000 AUM's a year, increasing to approximately 920,000 AUM's by the fifth decade. Oil production would be at a moderate level, producing about 334 million barrels. In response to the existing 10-year timber plan, the harvest for the first decade is 4.1 MMBF and would increase to 7.0 MMBF and remain at that level for the planning horizon. Roading would increase across the Forest by 1,295 miles.

This alternative would provide a moderately low opportunity to manage wildlife habitat by allocating 163,000 acres to wildlife emphasis. Another 157,500 acres or 49 percent of the inventoried roadless resource would be designated for roadless management. The areas known as Essentially Roadless Areas in North Dakota would be retained, although there are significant oil and gas development in some of them. No additional areas would be recommended for wilderness classification. Developed recreation facilities would be maintained to prevent deterioration.

During the first decade, an annual average budget of $7,050,000 would be required.

F. Alternative 5a

The objective of this alternative is primarily the same as Alternative 5, while significantly increasing the amount of wilderness. The development of this alternative was the same as Alternative 5, except that approximately an additional 182,000 acres of roadless areas (in addition to the 339,841 acres in the Absaroka-Beartooth Wilderness) were designated to wilderness. As a result, intensive management practices and resource coordination becomes necessary to provide a current level of outputs.

The grazing would stay at the current level, about 875,000 AUM's a year, increasing to about 919,000 AUM's by the fifth decade. Oil production would be slightly reduced from Alternative 5 by about 9 million barrels, producing 326 million barrels. The harvest level of this alternative would be 6.7 MMBF in the first 10 years, increasing slightly to 6.8 MMBF for the remainder of the planning horizon. Roading would increase 1,492 miles, 197 more miles than needed in Alternative 5. The opportunity for motorized access throughout the Forest is slightly increased in this alternative.

Wildlife management would be emphasized on about 115,000 acres in this alternative. This is 47,000 acres less than in Alternative 5. Approximately 45,900 acres or 18 percent of the inventoried roadless resource would be retained. The recreation setting for developed recreation would be the same as for Alternative 5. The additional

wilderness areas would not eliminate any developed recreation sites. The nonmotorized component of the dispersed recreation activities would increase in the newly designated wilderness areas.

The average budget for the first 10 years would be $7,500,000.

G. Alternative 5b

The objective of this alternative is the same as Alternative 5, but investigates a different level of wilderness and roadless designation. The formulation of this alternative was the same as Alternative 5 in regard to current resource outputs. The level of wilderness was lowered to 93,500 acres and specific areas adjacent to the Absaroka-Beartooth Wilderness were identified for addition to that Wilderness. The roadless areas were set at a higher level than Alternative 5a, retaining 125,900 acres or 49 percent of the inventoried roadless resource.

The level of grazing would stay at current level, about 875,000 AUM's a year. Oil production would be further reduced in this alternative from Alternative 5. The restrictions placed on oil production by wilderness and roadless classification would be responsible for the drop in production. The harvest level in this alternative would be 6.6 MMBF in the first decade. The roading across the Forest would increase by 1,470 miles during the entire planning horizon (175 miles more than Alternative 5), reflective of the greater management intensity of this alternative over Alternative 5.

This alternative would offer less opportunity to manage wildlife habitat than Alternative 5. Slightly over 146,000 acres would be designated to wildlife emphasis. Recreation management would be very similar to Alternative 5.

The average budget for the first 10 years would be $7,000,000.

H. Alternative 5c

The objective of this alternative is the same as Alternative 5, only investigating a different level of wilderness and roadless designation, emphasizing more wilderness and roadless than what currently exists. The formulation of this alternative was the same as Alternative 5 in regard to current resource outputs. Roadless management would occur on 184,400 acres (71 percent of the inventoried roadless resource) and wilderness classification would be recommended on 11,000 acres.

Grazing levels would be the same as Alternative 5, but oil production would be slightly less, but more than Alternative 5a and 5b, producing 331 million barrels. In response to the 10-year timber plan for the forest, 6.7 MMBF of timber would be harvested for the first decade.The arterial and collector roads would increase by 1,482 miles over the entire planning horizon (75 years).

This alternative would be very similar to Alternative 5 in the opportunity to manage wildlife habitat. About 160,900 acres would be designated to wildlife emphasis. Recreation management would be same as Alternative 5, although the driving for pleasure component would increase in proportion to other activities because of the greater roading.

The first decade would require an average annual budget of $7,400,000.

I. Alternative 6

This alternative was the Proposed Action in the Draft EIS. It is presented again in the Final EIS for comparison purposes. Alteranative 6 was modified based on public comment to create Alternative 10, the new Proposed Alternative. Alternative 6 was designed to respond to a variety of resource needs and the issues and management concerns facing the Forest. New management strategies were developed in response to changing needs. This alternative has very site specific constraints that would meet the need of each particular Ranger District. These were translated into outputs requirements or prescription constraints.

Grazing continues near current levels. The grazing level would reach 913,000 AUM's by the end of the fifth decade. Oil production is at 337 million barrels. Oil and gas development would continue to impact the wildlife habitat and range productivity in order to produce this level of oil. Timber would be harvested at the level of 4.0 MMBF in the first decade and remain at that level in the following years. Roading would increase by 1,857 miles over the next 75 years to produce the identified level of timber and oil for this alternative.

This alternative would provide a fairly high opportunity to manage wildlife habitat with about 268,500 acres designated to wildlife emphasis. Of this acreage, 18,600 acres would be woody draws and riparian areas. Approximately 125,500 acres or 49 percent of the inventoried roadless resource would be retained and 11,000 acres would be recommended for wilderness classification. Developed recreation facilities would be maintained to prevent deterioration and to enhance the setting, particularly on the Beartooth Ranger District. There would be a few new sites constructed on the Ashland Ranger District to respond to the growing population in that area. Dispersed recreation activities would increase, particularly in regard to driving for pleasure, using the additional roads throughout the Forest and the wildlife-related activities (hunting, fishing, and nature study).

The first decade average annual budget would be $6,990,000.

J. Alternative 6a

The objective of this alternative is the same as Alternative 6 with a small increase in wilderness and roadless areas to broaden the range of analysis. Formulation of this alternative was the same as Alternative 6, using very site specific constraints that meet the need of particular Ranger Districts.

Wilderness recommendations would be made for 36,600 acres, and 120,100 acres or 47 percent of the inventoried roadless resource would be retained. Recreation sites, particularly on the Beartooth Ranger District, would be managed to enhance the recreation opportunity. Dispersed recreation activities would increase, but the activity of driving for pleasure would not increase to the same extent as in other alternatives because the additional roading is less in this alternative. This alternative would provide less opportunity for wildlife management than Alternative 6. Slightly over 178,000 acres would be designated to wildlife emphasis, and of those acres, 11,100 acres would be woody draws and riparian areas.

While grazing levels remain the same as Alternative 6, more acres would be put into range emphasis in order to maintain that level. Oil production in this alternative would be 336 million barrels, nearly the same as Alternative 6. The roading network would increase by 1,861 miles over the 75 year planning horizon, also the same as Alternative 6. Harvest levels would reach an average 8.4 MMBF during the first 10 years and throughout the entire planning horizon.

An average annual budget of $7,400,000 would be required during the first decade.

K. Alternative 6b

The objective of this alternative is the same as Alternative 6 with a large increase in wilderness areas and a decrease in roadless areas to broaden the range of analysis. Formulation of this alternative was the same as Alternative 6, using very site specific constraints that meet the needs of each particular Ranger District. Additional wilderness was identified, as well as a level of roadless management that is lower that in Alternative 6 and 6a.

Approximately 105,800 acres would be recommended for wilderness classification and 81,600 acres or 32 percent of the inventoried roadless resource would be retained in roadless management. Developed recreation facilities would be maintained. Most sites would be available the regular use season (3 months). Dispersed use would increase much the same as in Alternative 6 and 6a, although the wildlife related visitor days would not increase to the same level at the end of the fifth decade as these other two alternatives. This alternative would provide less opportunity to manage wildlife than either Alternative 6 or 6a. About 179,000 acres would be designated to wildlife emphasis, and of this acreage 10,800 acres would fall in the woody draws and riparian areas.

Grazing levels would begin about the same level as Alternatives 6 and 6a, but would increase faster reaching 934,000 AUM's by the fifth decade. The addition of wilderness and roadless areas would, for the most part, create this reduction. The roading would increase by 1,825 miles, very similar to Alternatives 6 and 6a, over the 75 year planning horizon. This roading would be needed to produce the level of oil and timber harvest identified for this alternative. This alternative would harvest 6.7 MMBF during the first 10 years, greater than Alternative 6, but less than Alternative 6a. For the first decade the average annual budget would be $7,100,000 and would produce the goods and services that would return $48,900,000 to the Federal Treasury and $12,200,000 to the States' treasuries.

L. Alternative 7

The objective of this alternative is to produce a high level of market goods and services, contributing to the National and the local economies in the most cost-efficient manner. This alternative was formulated to optimize the production of timber, livestock grazing, and oil and gas while maintaining the concept of multiple-use management. The constraint levels for these outputs were derived from the benchmarks where each resource achieved an optimal level, although the current 10-year timber program was used. District levels were established in order to level the production of the outputs across the Forest. The only additional wilderness would be Lost Water Canyon, 9,800 acres.

Grazing levels in this alternative would begin higher than the current level, about 906,000 AUM's increasing to 976,000 in 50 years. Oil production would be 344 million barrels of oil, one of the highest levels. This alternative would harvest 6.0 MMBF during the first 10 years, increasing to 11.2 MMBF by the fifth decade. Roading would increase on the Forest by 1,882 miles over the next in 75 years.

About 121,300 acres would be managed for wildlife emphasis in this alternative, not providing much opportunity to increase wildlife habitat. Roadless area management would occur on 93,100 acres, or 36 percent of the inventoried roadless resource. The developed recreation facilities would be maintained and the recreation setting enhanced in this alternative. Dispersed recreation activites would increase, particularly driving for pleasure and other road-related activities in response to the greater miles of road available.

The average annual budget for the first decade would be $7,100,000.

M. Alternative 7a

The objective of this alternative is the same as Alternative 7, only with an increase in wilderness acres. Formulation of this alternative was the same as Alternative 7, except that 47,580 acres were specified for additional wilderness.

Grazing levels would be the same as Alternative 7, increasing to 975,000 in the fifth decade. Although leasing in the recommended wilderness areas would not be allowed, oil production would drop only slightly (dropping only 2 million barrels of oil) to 342 million barrels. This alternative would harvest 6.0 MMBF during the first 10 years, increasing to 9.6 MMBF by the fifth decade. Roading would increase in this alternative by 1,836 miles, very close to the amount needed in Alternative 7.

This alternative would designate slightly over 114,000 acres to wildlife emphasis, similar to Alternative 7. Although no roadless area were required in this alternative, 80,300 acres (31 percent of the inventoried roadless resource) were designated for roadless management. Recreation management would be the same as Alternative 7, encouraging those activities that produce revenue. The dispersed recreation activities, especially driving for pleasure, would be expected to increase in regard to greater amount of roads available.

During the first decade, the required annual average budget would be $6,970,000.

N. Alternative 7b

The objective of this alternative is the same as Alternative 7, except than 105,220 acres were designated as recommended wildernesses. No roadless constraints were made.

The grazing level in this alternative would be the same as Alternative 7 and 7a. Because of the additional wilderness, oil production would fall below Alternative 7 and 7a, producing 331 million barrels. The timber harvest in this alternative would be very similar to Alternative 7a, beginning at 6.0 MMBF in the first decade. This alternative would increase roading by 1,836 miles, slightly less than Alternatives 7 and 7a.

90,400 acres would receive wildlife emphasis, offering little opportunity to manage additional habitat. In addition to the recommended wilderness, 64,300 acres (25 percent of the inventoried roadless resource) would be retained in roadless management. Recreation management would be the same as Alternatives 7 and 7a. Wildlife-related activities would be at one of the lowest levels of all of the alternatives.

The average annual expenditures for the first decade would be $6,900,000.

O. Alternative 8 (Current Management)

The objective of this alternative is to continue a level of livestock forage (determined to be the minimally acceptable and representative of actual use over the last 5 years), maintain a level of timber representing the average volume cut over the past 10 years, limit the budget to an average over the past 3 years with a 5 percent increase through time. Certain areas were identified for roadless management. The remaining outputs were left unconstained to be responsive to the budget.

While grazing would occur at a fairly even rate, it would be less than the currently permitted AUM's. Beginning level would be 894,000 AUM's dropping to 800,000 in response to oil and gas development and reaching 833,000 by the fifth decade. Production of oil and gas would drop off considerably in this alternative, producing 167 million barrels. This is due mainly to the 1.2 million acres managed under minimum level which does not provide the administrative support for a high level of oil production. This alternative would harvest 4.0 MMBF in the first decade, dropping to 3.2 over the planning horizon. Arterial and collector roads would increase by 601 miles over the next 75 years. These miles of road would be the permanent transportation network for the Forest.

About 9,580 acres would be designated to wildlife emphasis in this alternative. Approximately 184,800 acres or 72 percent of the inventoried roadless resource would be retained in roadless management and 18,800 acres would be recommended for wilderness classification. The developed recreation facilities would not be maintained and the use season would be shortened to reduce potential overuse of the areas. Activities would tend towards dispersed rather than at developed sites. Dispersed recreation would increase but slowly, responding to the amount of land in a minimum level of management.

An average annual budget of $4,400,000 for the first 10 years would be required.

P. Alternative 9 (Departure)

The objective of this alternative is the same as Alternative 6, to continue the current level of selected outputs and the management direction from the unit plans. The only change in this alternative was that the nondeclining-sustained yield for the timber resource was removed, allowing timber to be harvested on a fluctuating rate in response to other resource needs.

Most resource responded similarly to Alternative 6. The major difference in this alternative would be the uneven flow of timber through time. Decade production would show 3.1 MMBF in the first decade, but the second decade harvest

would be 4.4 MMBF, dropping to 4.0 MMBF in the third decade. Thus, the flow would be fluctuating through time without the nondeclining sustained yield requirement.

The first decade annual average budget would be $7,000,000.

Q. Alternative 10 (Proposed Action)

The objective of this alternative is to modify Alternative 6, the proposal action in the Draft E.I.S., to be responsive to the public comments. It addresses issues and management concerns facing the Forest. Major revision occurred in wildlife areas, roadless area designation, and grazing and timber harvest levels. The following chart shows the changes in resources of interest:

Resource	Alternative 6	Alternative 10(PA)
Wildlife	268,500 acres	359,000 acres
Roadless	115,000 acres	122,600 acres
Grazing	875,000 AUM increasing to 913,00 AUM	865,000 AUM increasing to 875,000 AUM
Timber	4.0 MMBF	3.0 MMBF
Oil	337 M barrels	316 M barrels
Roading	1,857 miles	1,857 miles
Wilderness (recommended)	6,000 acres to A/B 5,000 acres (Lost Water Canyon)	SAME
Budget	$6,990,000	$6,680,000

A more detailed description of these alternatives can be found in Chapter II, Section A. These alternatives are compared on how major resources outputs and economics vary. The comparison centers on these resources:

Recreation
Wilderness, Recommended Wilderness and Roadless Areas
Visual Quality
Research Natural Areas
Wildlife
Fish
Range
Timber Harvest
Watershed
Minerals
Road System
Fire Management
Energy Consumption
Economic Impacts and Comparisons
Social Effects
Public Net Benfits

Section D of Chapter II in the main text of the EIS shows these comparisons. Often the range of outputs does not appear to be very broad, although the range of the alternatives in terms of purpose, theme and management options is indeed very broad. Many of the social and economic results seem very minor in respect to the total Forest picture and to the great expanse of the Custer National Forest, involving 3 states, nearly 4 million gross acres, and spanning over 640 miles east and west and 240 miles north and south. These ideas will be important to keep in mind as you review the document.

For more details regarding the FORPLAN development of the alternatives, see Appendix B.

III. AFFECTED ENVIRONMENT

This section describes the environment that may be changed by the implementation of the proposed action or alternative plans considered.

A. Physical, Biological, Social, and Economic Settings

The lands of the Custer National Forest lie within 20 counties in Montana, North Dakota, and South Dakota. They are scattered from the northeast corner of Yellowstone National Park in Park County, Montana, to Richland County in the southeastern corner of North Dakota. The southernmost portions are at the Montana-Wyoming line near Red Lodge, Montana. The Denbigh and Souris purchase units east of Minot, North Dakota, are the farthest north. The portions of the Forest in South Dakota extend as far east as Corson County, east of the town of Lemmon. Distances involved are about 240 miles north-to-south and 640 miles east-to-west. The landscape and its components that make up the visual resource of the Custer National Forest span five landscape character types within Montana, North Dakota, and South Dakota. These types are called Yellowstone Rockies, Rocky Mountain Foreland, Big Dry, Middle Missouri, and Red River, and are described in the USFS, R-1 Publication, *Visual Character Types and Variety Class Descriptions.*

The Custer National Forest contains a wide variety of geologic settings, ranging from the igneous-metamorphic rocks of the Beartooth Mountains, to deep sedimentary basins, to areas of continental glaciation. Elevations range from 905 feet above sea level in the eastern end of the Forest to 12,799 feet above sea level in the west end of the Forest.

The climate of the Custer National Forest is Continental, which means that summers are short and hot and winters are long and cold. Temperature extremes are also broadened by great elevation differences. Temperature regimes range from temperate to subartic. Moisture regimes vary from subhumid to semi-arid.

The Custer National Forest has characterized its lands and stratified land capabilities on the basis of ecosystems. Previous to this Forestwide planning effort, the ecosystems were mapped and described for all the lands except the Grand River and Cedar River National Grasslands. During this

planning procedure, the ecosystems were also described for these two Grasslands that are administered by the Grand River Ranger.

There are four areas where management activities are likely to impact diversity: (1) timbered stands, (2) fire related ecosystems, (3) riparian/woody draw zones, and (4) grasslands (residual bird nesting cover).

The human population is largely rurally oriented, with strong ties to the land and to the many small towns. In both of the metropolitan counties, containing Billings, Montana, and Fargo, North Dakota, the populations are roughly 65 percent urban and 35 percent rural.

In the majority of the zone counties, agriculture and its related support services are the primary economic base. A few counties are experiencing high oil, natural gas, and/or coal development. However, their agricultural activities are still the long-term bases of their economy. The two metropolitan counties have business, manufacturing, professional services, and other economic foundations, as well as the agricultural components.

The average 1981 per capita income of people in the 26 rural zone counties for which complete data were available was $9,585, compared to the average of $9,495 for the three states (Montana, North Dakota, and South Dakota), and the average of $10,766 for the two metropolitan counties. However, when one converts the 1973 and 1978 per capita data into 1981 constant dollars, the changes reveal a general trend that indicates that per capita income increases are not keeping pace with inflation.

The future economic situation for most of the zone counties will continue to be dependent on the suitability of the agricultural base. For the counties producing oil and natural gas, those resources dominate the revenue picture at present, but they represent resource revenues that can fluctuate rapidly, and do not in any way negate the value of the long-term, relatively stable foundation of the renewable resources, particularly agriculture. Further, only a small percentage of the people in the energy resource counties are actively engaged in energy development. As a consequence, one must not in any way discount or overlook the economic significance of the renewable resources, even though at present they are vastly overshadowed by the mineral resource revenues in those energy counties.

Various percentages of the total Federal receipts (including those from other Federal land managing agencies with revenues) are returned to the states and counties in which the Custer National Forest land occurs. In FY 1983, the total payments to the counties from all of these agencies was $10.5 million and,total payments to the states was $15.8 million.

B. Current Resource Situation

The recreation setting on the Custer is as varied as the land that comprises the Forest. There are mountains, foothills, prairie, and badland environments that are used by the public for many recreation activities.

The physiography of the Forest allows access to much of the Forest, with the exception of the Beartooth Mountains and the portions of the Little Missouri Badlands that are as yet unroaded. This situation creates the capacity for recreation activities that is greater than what would be expected. Road construction, in conjunction with mineral development in the Little Missouri National Grasslands, has created Semi-Primitive Motorized (SPM) and Roaded Natural Appearing (RNA) opportunities that were not previously available.

The Custer National Forest contains one of the richest and most diverse series of archeological and historical sites in North America. This is due in part to the remarkable diversity in topography and ecosystems found within the widely scattered administrative units of the Forest. As a result of this diversity, the Northern and Northwestern Great Plains and the nearby mountain foothills supported an extremely varied series of Native American groups for at least 14,000 years. Since the advent of non-native settlements, low population density and limited industrial and agricultural development have contributed to the high degree of preservation and the generally good condition of the cultural resources.

The Absaroka-Beartooth Wilderness contains 920,377 acres in south central Montana on the Gallatin and Custer National Forests. There are 339,841 acres located within the Custer National Forest in Park, Sweetgrass, Stillwater, and Carbon Counties. One mile of the southwest corner of the Wilderness borders the northeast corner of Yellowstone National Park.

Through the RARE II process, a number of Roadless Areas were identified. Some of these areas are roadless and others have become roaded primarily by oil and gas development.

The Custer provides a wide diversity of wildlife habitats, ranging from alpine meadows, to short and tall grass prairies, to eastern hardwood stands. High mountain streams and lakes support many cold water trout species, while on the prairies the small water impoundments, lakes and larger rivers support a variety of warm water fish species. The Forest encompasses four of the five major ecoregions that occur within Forest Service administered lands in Region 1. This wide diversity provides an array of habitats for wildlife species as diverse as prairie chickens and mountain goats, goshawks and eastern chipmunk. There are also sizeable populations of turkeys, bighorn sheep, moose, black bears, merlins, and antelope

on the Forest. Management for this variety of wildlife and habitats is an ongoing challenge. The Forest also provides at least potential habitats for four threatened or endangered species: grizzly bears, black-footed ferrets, bald eagles, and peregrine falcons.

The range management program on the Custer National Forest is the largest within the National Forest System. Rangeland ecosystems on the Custer National Forest are extremely diverse. They vary from high mountain meadows and ridgetops to short, mid, and tall grass prairies. Approximately 78 percent or 1.6 million acres of the Custer National Forest's 2.4 million acres is considered as suitable range. The remaining acres, nearly 835,000 are presently considered unavailable or unsuitable for range use. Forage production on suitable range can vary from approximately 100 lbs./acre to over 3,000 lbs./acre. The diversity of the range also makes it very valuable as wildlife habitat. Competition exist between domestic livestock and wildlife species for forage in key areas at certain times of the year.

In 1980, the Custer National Forest permitted 875,567 AUM's through direct grazing permits and six grazing agreements. In addition, the Forest and/or Grazing Associations administer in excess of 100,000 AUM's under private land permits or the equivalent on the National Grasslands.

The wild horse territory is located on 3,800 acres in the Pryor Mountains east of Lost Water Canyon. This area will be managed in cooperation with the Bureau of Land Management. The management options are limited, however, resulting in all alternatives considering this area for wild horse management only.

The Forest contains 530,195 acres of forested land. Of this, 300,428 acres do not meet productivity standards, and an additional 61,750 acres are not available for timber harvesting due to existing or administratively-proposed special classifications. This leaves 156,731 acres of productive forest land available, suitable for, and capable for timber management. Productive forest lands are those lands capable of growing at least 20 cubic feet per acre per year.

Currently, about 1,091,500 acre feet of water annually run off Custer National Forest system lands. Ninety-five percent of that water meets or exceeds minimum quality standards. The remainder has excessive sediment due to natural erosion or to excessive dissolved salts from certain highly saline soils.

Many different mineral resources are found on lands administered by the Custer National Forest. Among these are oil and gas, coal, uranium, gold, silver, copper, nickel, platinum, palladium, molybdenum, chromite, and iron, as well as the more common variety of minerals, such as sand, gravel, and porcellanite (scoria). With the exception of the Absaroka-Beartooth Wilderness and the Pryor Mountains on the Beartooth Ranger District, and the entire Sheyenne Ranger District, nearly all of the lands on the Forest are currently leased for oil and gas or have leases pending. Oil and gas have been produced on the Little Missouri National Grasslands since the mid 1950's. The Sioux District currently has three producing wells.

Currently, the Forest produces approximately 12.4 million barrels of oil per year. At this rate of production, the Forest provides the amount of oil used by the Nation in one day or .24 percent of the annual National demand. This production involves approximately 610 producing wells in 54 oil fields which are located almost entirely on the 1,270,851 acres of the Little Missouri National Grasslands. Approximately 870 miles of road and 700 miles of pipeline, along with tank batteries and other related facilities, have been constructed in order to produce and transport the oil and associated gas.

The coal beds within the Fort Union Formation underlie vast areas in North Dakota, South Dakota, and Montana. These States contain some 912 billion tons of coal (Geologic Atlas of the Rocky Mountain Region, 1972). Parts of the Beartooth, Sioux, and Grand River Districts, and all of the Ashland, Medora, and McKenzie Districts are within this area. It is estimated that less than 15 percent of the total is economically strippable. The quality of the coal ranges from lignite up to good quality low sulfur sub-bituminous coal.

Exploration for hardrock minerals under the 1872 Mining Law has been conducted annually with varying intensities on the Beartooth Ranger District for many years. The majority of this exploration has occurred on the Stillwater Complex portion of the District, which has the largest potential platinum and chrome deposits and the second largest nickel deposit within the United States. The Stillwater Mining Co. has recently (1984) submitted a mine plan to develop a platinum-palladium mine within the Stillwater drainage. An EIS is being prepared to assess the impact of this mine.

Uranium (uraniferous lignite) was mined on the Sioux Ranger District in the late 1950's. Presently, there is no mining of uranium, but a large number of mining claims are being maintained on the Sioux and Beartooth Ranger Districts.

Common variety minerals include sand, gravel, and porcellanite (scoria). Sand occurs Forest-wide. Gravel is found on all Districts, except the Sheyenne Ranger District. Porcellanite occurs on the Sioux, Ashland, Medora, and McKenzie Ranger Districts only. The current use of these materials is almost exclusively for road aggregate.

Roads are significant facilities which provide access to and within the Forest.

The Forest contains a wide variety of fuel types because of geographic distance and differences in elevation. Responses to fire vary widely and many ecosystems are fire related and/or fire dependent. The National Forest System lands have been influenced by man's fire-related needs for several hundred years, if one considers the use of fire by native Americans. Since shortly after the turn of the century, there has been an attempt by man to restrict or reduce the spread of natural and man-caused fires. This has had some long-term effects on certain ecosystems.

Noxious weed infestations on the Forest and on the intermingled private lands are an increasing problem. There are several Federal and State laws that give broad authority for or require control of such weeds. The Forest has approximately 10,000 acres that are currently infested by noxious weeds. Leafy spurge is by far the predominant species, with approximately 7,500 acres. The Forest, in cooperation with County Weed Boards, Grazing Associations, and permittees, is currently treating approximately 3,000 acres per year. Control on the Custer is achieved through the Conservation Practices (CP) program on the National Grasslands.

The Custer National Forest is directed by the Clean Air Act Amendments of 1977 to maintain the quality of air passing over its lands. Except where otherwise designated, Class II air quality is to be maintained. There are numerous types of pollution which could be controlled, but particulates and sulfur dioxide are the two major pollutants of concern to the Custer. Air quality is generally good over all lands managed by the Custer National Forest except where oil and gas development is occurring. The Little Missouri National Grasslands (Medora and McKenzie Ranger Districts) are experiencing elevated air pollution levels from oil and gas activity. Some smoke is visible from gas flaring in these areas, but greater concern is warranted for the potential of H_2S (hydrogen sulfide) release. Little research is presently available on the effects of H_2S on vegetation and soils, but there is a valid concern that they may be serious. Present policies on flaring of gas provides the potential for serious long-term impacts. The Environmental Protection Agency recently used a portion of the Ashland Ranger District as a study site to determine pollution levels of certain paramenters in an unpolluted baseline condition.

IV. ENVIRONMENTAL CONSEQUENCES

The scientific and analytic basis for comparison of the alternatives, including the proposed action, is described in detail in Chapter II. The following paragraph briefly summarizes some of the major environmental effects discussed in detail in Chapter IV. Generally speaking, the topics are listed in increasing order of severity of environmental consequences.

A. Wilderness

The amount of Wilderness (established and proposed) in each alternative is dependent on the goals and objectives for that particular alternative. There are no specific activities associated with wilderness areas, although the establishment of these areas may eliminate the opportunity for a resource to be managed or removed. Ground disturbing activities, except for prospecting and mining of locatable minerals, are generally prohibited. Acres recommended for wilderness by alternative are displayed in the table at the end of Chapter II.

B. Roadless Resource

The amount of land to be managed in an unroaded condition varies by alternative and is dependent on the goals and objectives for that particular alternative. There are few, if any, activities specifically associated with roadlessness. Most unroaded areas are assigned to unroaded management to enhance recreation or wildlife values. Management without roads reduces or limits the types and amounts of activities that can occur within them. Therefore some outputs are reduced as the number of acres to be managed as unroaded increases. The acres to be managed in an unroaded condition are displayed in the table at the end of Chapter II.

C. Developed Recreation

Developed recreation sites are high cost per acre facilities due to construction, maintenance, clean-up, monitoring, and policing. User fees are currently charged at some campgrounds, and a decision could be made to charge user fees at other sites. Hence, some income is generated. However, this extra income has little effect on the PNV of the Forest as a whole, and even fails to offset the cost of Forestwide developed recreation activities. The existence of a developed recreation site limits the type of activity that can occur adjacent to it. The recreation setting around a developed site is considered an integral part of the site, and therefore activities that conflict with the recreation experience are usually avoided or limited to a season when use is light or nonexistent.

D. Wildlife Habitat

Protection of wildlife habitats reduces the amount and types of activities that can occur on these areas. A number of key wildlife habitats are identified and the level of grazing by domestic livestock is either reduced, to protect these key areas, or in some areas eliminated. There are also a number of key wildlife areas that will not be available for

the development of gas and, and therefore reducing the supply of these products as well as reducing the dollar returns to the United States Treasury, the States, and the local governments.

E. Utility Transportation Corridors

Utility transportation corridors involve a long-term commitment of lands to essentially one use. Some other compatible activities such as grazing may occur under powerlines or over pipelines. Overhead and underground facilities often require some maintenance and therefore a long-term road is often needed. Overhead powerlines may short out or fall down and start fires or cause damage in other ways. Birds sometimes collide with overhead powerlines, resulting in losses of birds. Overhead and underground facilities usually create a visual impact, thus reducing the scenic value of the area.

F. Timber

1. Slash Control

Slash or unusable limbs, tops, and cull logs usually must be removed from a timber harvest unit before regeneration can take place. The most common method of disposal is to burn the slash on-site, but, in some cases, large amounts are hauled away to be used as firewood. Burning of slash can result in smoke in the air, and if weather conditions are bad, this smoke can be a nuisance to local residents and in rare instances exceed clean air guidelines. The burning of slash also creates a visual impact on the environment for a short period of time.

2. Site Preparation

Site preparation by burning or mechanical scarification creates some ground disturbance which increases soil erosion and alters the uppper edge of the soil profile. Site preparation prepares a seedbed for noxious weeds as well as for trees. Site preparation also destroys habitat for birds and mammals dependent on slash and brush for cover.

3. Timber Stand Improvement

Precommercial and commercial thinning are the two activities associated with timber stand improvement. Thinning activities remove the smaller less desirable trees and therfor alter the habitat for birds and animals dependent on dense stands. Removal of trees also opens up the stand enough to allow more grass and shrubs to grow, which increases habitat for species dependent on that environment. Thinning debris creates an environment suitable for the increase of some insects, which can move into the residual stand if the thinning is not properly designed and implemented at the proper time of year.

4. Timber Harvest

Timber harvest occurs on the three National Forest Ranger Districts (Beartooth, Ashland, and Sioux) on the Forest. The harvesting of timber exposes the soil to erosion and removes cover that normally shades the snow in the spring. The removal of trees also removes cover and nesting habitat for animals and birds. Timber harvest can adversely alter the scenic value of an area.

5. Logging Methods

The choice of a logging method depends largely on land slope, sensitivity of the soils, needed protection of the visual qualities of the area, and the type of equipment available in the area. Nearly all logging on the Forest is conducted with rubber-tired or crawler tractors. Some cable logging is anticipated in the future. Tractor logging results in skid trails of exposed mineral soil which are succeptible to water erosion. Residual trees may receive some mechanical damage as trees are skidded past them and damage the trunks as well as shallow roots. Cable skidding generally results in smaller skid trails, but they are oriented directly up and down the hill and are therefore more difficult to protect from erosion by water.

G. Minerals — Including Oil and Gas

Many different minerals are found on the Forest. These include oil and gas, coal, uranium, gold, silver, copper, nickel, platinum, palladium, molybdemum, chromite and iron, as well as the more common variety of minerals such as sand, gravel and scoria. The following section briefly summarizes the impacts that occur through the exploration and development of oil and gas, locatable minerals, coal, and common variety minerals.

1. Oil and Gas

The steps in the exploration and development of oil and gas are leasing, geophysical prospecting, exploratory drilling, and development (drilling and production). Each of these steps has its own unique type of impacts.

a. Leasing

Oil and gas related activities generally begin with lease applications and the issuance of leases by the BLM with the consent or recommendation of the Forest Service. The issuance of a lease does not have a direct effect on other resources, but it is a commitment of resources for the term of the lease (usually 10 years). The potential effects of this commitment are controlled somewhat by attaching stipulations to the lease. Although the lease grants the leaseholder the right to explore and develop his lease, these activities must be within the terms of the lease.

b. Geophysical Exploration

The next step in oil and gas development after leasing is geophysical exploration. This activity may utilize any of several techniques, from vibroseis on existing roads to exploding charges 200 or

more feet below the ground surface. Geophysical activities may take place over the same area many times, and may continue over a number of years. Geophysical operations can result in harrasment of wildlife as a geophysical crew may work in an area for several days. This unnatural increase in people, trucks, helicopters, and the explosion of charges can disrupt birds, animals, and recreationists. The drilling of holes for the placement of charges can contaminate aquifers.

c. Exploratory Drilling

The next step after collection of seismic data and identification of potential drilling targets is the drilling of an exploratory or "wildcat" well. To transport a drill rig capable of drilling to 12,000 to 15,000 feet requires a road capable of handling 30 to 40 semi-trucks and trailers (low-boys) of heavy equipment and 50 to 100 vehicles per day. Also, a drill pad of about 5 acres is needed for the drill rig. On steep topography, this requires the movement of a large amount of material. The major impact of exploratory drilling is the construction of the needed access route and drill pad. There are other risks, such as a blowout if new or unexpected formations are drilled. After a wildcat is drilled it is tested, and during this period poisonous gasses such as hydrogen sulfide may be flared. During this same testing period the produced fluids must be trucked, away increasing the flow of traffic and increasing the risk of spilling the produced fluids if a vehicle accident occurs.

d. Development

Development of an oil field, once the exploratory well is determined to be a "producer," generates another phase of impacts. Roads are upgraded to permanent all-weather specifications. If needed, additional space is provided to place tank batteries to store oil and water on or near the drill pad. Temporary storage tanks are used until the volume of production is known. Then the liquids are either trucked out at regular intervals, or pipelines are installed to transport the product to refineries. If an exploratory well is productive, additional wells will normally be drilled to define the limits of the oil field. This would involve building additional roads, well pads, tank batteries and possibly installing additional pipelines and electrical powerlines. The construction of roads, drilling of wells, and related traffic can result in considerable disturbance to wildlife and domestic livestock. Additional acres of natural vegetation are destroyed by roads and drill pads, therefore reducing the capacity of the area to produce grass and/or trees. Dust from roads can reduce the palatability of grass, forbs, and shrubs. Construction of pipelines to remove oil and gas from the producing wells creates more ground disturbance and increases the opportunity for erosion and establishment of undesirable vegetation.

2. Locatable Minerals

The 1872 mining law provides for the exploration and development of locatable minerals on public domain lands that are not withdrawn from mineral entry. The Beartooth Mountains contain the highly mineralized Stillwater Complex which contains the Nation's largest known platinum and chrome deposits and the second largest nickel deposit. This area has seen varying levels of activity for many years. Currently, a project EIS is being prepared for the proposed development of a platinum-palladium mine. This project is beyond the scope of this EIS and is being studied in detail in the project plan.

3. Coal

The Custer National Forest is underlain with an abundance of coal. As explained in Chapter III, the coal under National Forest lands is not available for development by surface mining at this time (Surface Mining Control and Reclamation Act of 1977). A "coal unsuitability" study was conducted for lands in the Little Missouri National Grasslands. Surface mining is not recommended, and if it ever occurs within the National Grasslands a project specific Environmental Impact Statement will be needed to evaluate the effects.

4. Common Variety Minerals

Common variety minerals on the Forest include sand, granite, and porcellanite (scoria). Sand occurs Forestwide, gravel on all Districts, except the Sheyenne Ranger District, and porcellanite on the Sioux, Ashland, Medora, and McKenzie Ranger Districts only.

H. Range Management

Currently, 875,000 AUM's of livestock forage are actually grazed on the Forest. Grazing is an important contributor to the economy of the Forest. Approximately 763 livestock producers are totally or partially dependent on grazing the National Forest System lands for their livelihood. There are 1,628,720 acres suitable for range management on the Forest. The economic and social benefits of the grazing industry on the Forest are of great importance to the lifestyle of the livestock producers that use the Forest.

1. General

Allowing livestock grazing in itself will have an effect on the socio/economic and environmental resources. The intensity of grazing, both in animal numbers and length of grazing season, proportionally magnifies or diminishes the degree of impact. The higher the number of permitted livestock the more structural and nonstructural improvements are needed. Grazing in and of itself has a considerable effect on the environment. Grass removed by cattle grazing is not available as cover or feed for birds or other animals. The effects of trampling of fragile sites

reduces the desirability of these areas for birds, other animals, and man.

2. Structural Range Improvements

Structural improvements include fences, wells, spring development, water pipelines, and windmills. The construction of these facilities takes some land out of production and also concentrates cattle. The concentration of cattle usually results in trampling of vegetation, and the concentrations of flies and manure. Heavy concentrations of cattle over many years results in a complete loss of natural vegetation and the area is committed to one use for the foreseeable future.

3. Non-structural Range Improvements

Nonstructural range improvements include activities such as noxious weed control, interseeding, ripping, furrowing, treating conifer encroachment, sagebrush control, and fertilization. Removal of vegetation by physical or chemical methods results in that vegetation not being available for use by birds or animals. The cost of treating vegetation is irretrievable, and the treated vegetation that is destroyed is irreplaceable.

I. Road System

Road construction and maintenance have a greater effect on other resources than any other Forest management activity. The primary effects are the displacement of large amounts of soil, increased vehicle access, and greater impacts on the landscape. The movement of soil for construction of a road increases the risk of soil erosion and mass movement of soils. Roads are generally quite visible and adversely affect the scenic value of an area, even though they do provide access so that more people can view the area from the convenience of a road.

SELECTED OUTPUTS

Resources	Unit of Measure	1980 RPA		Alternative/Benchmark													CM	Dep	PA	MAX	MIN
		1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10	PNV	LVL
Developed recreation projection	M RVD					1980 = 306															
Decade 1		400	442	450	427	462	466	455	461	448	445	388	439	412	417	368	449	433	450	361	
Dispersed recreation projection	M RVD					1980 = 450															
Decade 1		530	555	566	456	575	580	570	573	564	560	508	551	527	530	481	565	551	560	485	
Wilderness management	M Acres			(In addition to 339,841 acres of A/B Wilderness)																	
		129	0	0	242	0	182	94	11	12	37	106	10	48	105	19	10	12	00	00	
Roadless management	M Acres			1983 = 265,920																	
		117	12	120	17	158	46	126	184	126	120	82	93	80	64	185	109	115	00	00	
Elk provided capacity	Elk			(1980 Base Year = 950 Elk)																	
Decade 1		1058	826	680	845	835	834	805	937	966	686	706	677	685	698	1042	845	972	684	1065	
Deer provided capacity	M Deer			(1980 Base Year = 21,000 Deer)																	
Decade 1		30	23	24	26	24	24	24	26	25	22	23	22	22	22	27	24	28	22	30	
Potential range forage	M AUM			1980 Base = 875 M AUMS																	
Decade 1		827	902	887	887	896	896	896	896	894	899	900	906	906	916	878	893	865	884	000	
Allowable Sale Quantity	MMBF			1980 = 1.5																	
Decade 1		3	2	4	3	4	7	7	7	4	8	7	6	6	6	4	3	3	0	0	
Oil production forecast	M BBLS																				
Decade 1		13504	15664	15667	14586	15212	15108	15073	15025	15451	15293	12309	15647	15599	15171	8203	15454	14552	17589	8450	
PNV of Federal Receipts @ 4%																					
		626	723	725	668	704	693	696	697	708	708	701	725	719	699	379	711	661	764	14	
PNV of Federal Receipts @ 7.125%																					
		557	640	644	597	329	624	625	625	631	630	612	640	632	617	359	632	588	678	80	
Cash flow to States	MM$																				
Decade 1		11	12	12	12	12	12	12	12	12	12	12	12	12	12	7	12	12	14	00	
Benefits discounted at 4%	MM$																				
Range		230	287	271	271	277	277	277	277	275	280	280	288	288	288	258	275	264	271	000	
Minerals		3246	3715	3718	3402	3604	3524	3560	3569	3639	3622	3587	3711	3686	3571	1818	3673	3404	3857	244	
Recreation		87	96	98	93	99	101	100	100	97	97	84	96	90	91	76	97	92	97	74	
Wildlife		246	178	205	203	191	189	190	191	195	190	188	174	174	173	170	195	208	190	181	
Timber		3	6	8	7	6	7	6	6	4	8	7	8	8	7	4	7	3	8	0	
Costs discounted at 4%	MM$																				
Range		40	54	49	49	50	50	50	50	50	51	52	58	57	58	36	50	49	49	00	
Minerals		5	6	6	6	6	6	6	6	6	6	6	6	6	6	2	6	5	6	0	
Recreation		15	14	15	16	14	18	18	16	13	15	12	15	14	14	2	14	11	15	1	
Wildlife		11	7	8	8	7	8	8	7	8	7	7	7	6	6	2	8	8	7	0	
Timber		9	14	15	11	12	14	16	16	10	20	15	19	15	14	8	10	6	10	0	
Other		91	87	87	88	87	92	93	88	87	87	86	88	87	87	57	87	86	87	32	
Present value benefits (4%)	MM$																				
		3812	4282	4300	3976	4178	4098	4132	4143	4210	4196	4146	4277	4246	4130	2327	4217	3972	4424	500	
Present value costs (4%)	MM$																				
		171	181	180	178	177	188	192	183	173	187	178	192	186	184	106	175	165	175	33	
Present net value (4%)	MM$																				
		3641	4000	4120	3798	4001	3910	3940	3959	4037	4009	3968	4085	4060	3946	2220	4042	3806	4249	467	
Benefit/cost ratio (4%)	MM$																				
		22	24	24	22	24	22	22	23	24	22	23	22	23	22	22	24	24	25	15	

CHAPTER I
PURPOSE AND NEED FOR ACTION

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PURPOSE AND NEED FOR ACTION

A. Introduction

This Environmental Impact Statement (EIS) documents the analysis and discloses the significant environmental effects of the preferred alternative and other alternatives for the future management of land and resources of the Custer National Forest. The preferred alternative is the basis for the Proposed Forest Land and Resource Management Plan (Forest Plan) which is described in a separate document. The Forest Plan will guide management of the Forest for the next 10 to 15 years, unless conditions or demands significantly change. The analysis in the EIS projects outputs and effects for up to 75 years to indicate the long-term implications of continuing with the Plan. While long range effects have been estimated, the Plan is only valid until it is revised, committing the Forest to a course of action for no longer than 15 years.

This analysis and the Forest Plan are designed to ensure multiple use and provide a sustained yield of goods and services from the Forest to maximize long-term net public benefits. Net public benefits are the overall long-term value to the Nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs), whether they can be quantitatively valued or not (36 CFR 219.3). Net public benefits include both priced and non-priced resource outputs, less all costs, produced under each alternative. Alternatives were designed to address the issues, concerns, and opportunities identified at the start of the planning process. These issues, concerns and opportunities were updated periodically throughout the planning process.

Development of this EIS and Forest Plan followed direction from the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), the National Forest Management Act of 1976 (NFMA), and the National Environmental Policy Act of 1969 (NEPA). Further direction was given by the implementing regulations of NFMA (36 CFR 219) and the Council of Environmental Quality's Regulations (40 CFR 1500-1508) for implementing NEPA.

Subsequent projects that implement Forest Plan direction will be tiered to this EIS and the appropriate environmental analysis referenced. Additional analyses may be required for projects with anticipated impacts not sufficiently addressed in this EIS.

B. National, Regional, and Forest Planning

This analysis and Forest Plan supersede all previous land and resource management plans for the Forest. They are a direct link to national and regional planning. The national program, required by RPA, sets national direction and output levels for National Forest System lands. These levels are based on suitability and capability information provided by Forest Service Regions. In its Regional Guide, the Northern Region divides its share of the national production levels among the Forests. The Guide also delineates standards and guidelines for management within the Region. The share for each Forest is based on detailed information furnished by the Forest. Thus the Forest Plan includes direction provided by RPA, NFMA (including the implementing regulations) and the Northern Regional Guide.

This EIS is the culmination of the first seven of ten planning actions required by NFMA (36 CFR 219). These planning actions are (refer to Appendix A and B for a detailed description of the planning process):

1. Identification of issues, concerns, and opportunities.
2. Development of planning criteria.
3. Inventory data and information collection.
4. Analysis of the management situation.
5. Formulation of alternatives.
6. Estimated effects of alternatives.
7. Evaluation of alternatives.

Comments were solicited from various public groups, individuals and governmental agencies on the Draft EIS and Proposed Forest Plan. Comments received were used to examine the results of the first seven planning steps and to modify, if necessary, the Forest Plan.

The Regional Forester uses this Final EIS and Forest Plan as a basis for his Record of Decision to complete the planning steps.

8. Selection of the preferred alternative.
9. Plan implementation.
10. Monitoring and evaluation.

It is the Record of Decision, a separate document, that explains the rationale for selecting Alternative 10.

C. Planning Area

The Forest is located in three states: Montana, North Dakota, and South Dakota, falling in 20

counties. (See Chapter III for a list of the counties.) As shown in Figure I-1, there are many parcels comprising the Custer National Forest. There are three National Forest Ranger Districts and four National Grassland Ranger Districts, containing four separate National Grasslands. A unique feature of Custer NF is its proximity to six Indian Reservations. The Crow, Northern Cheyenne and Fort Peck Reservations lie in Montana, Fort Berthold Reservation falls in North Dakota, Standing Rock Reservation bridges both North and South Dakota and the Cheyenne River Reservation lies to the south of Standing Rock in South Dakota.

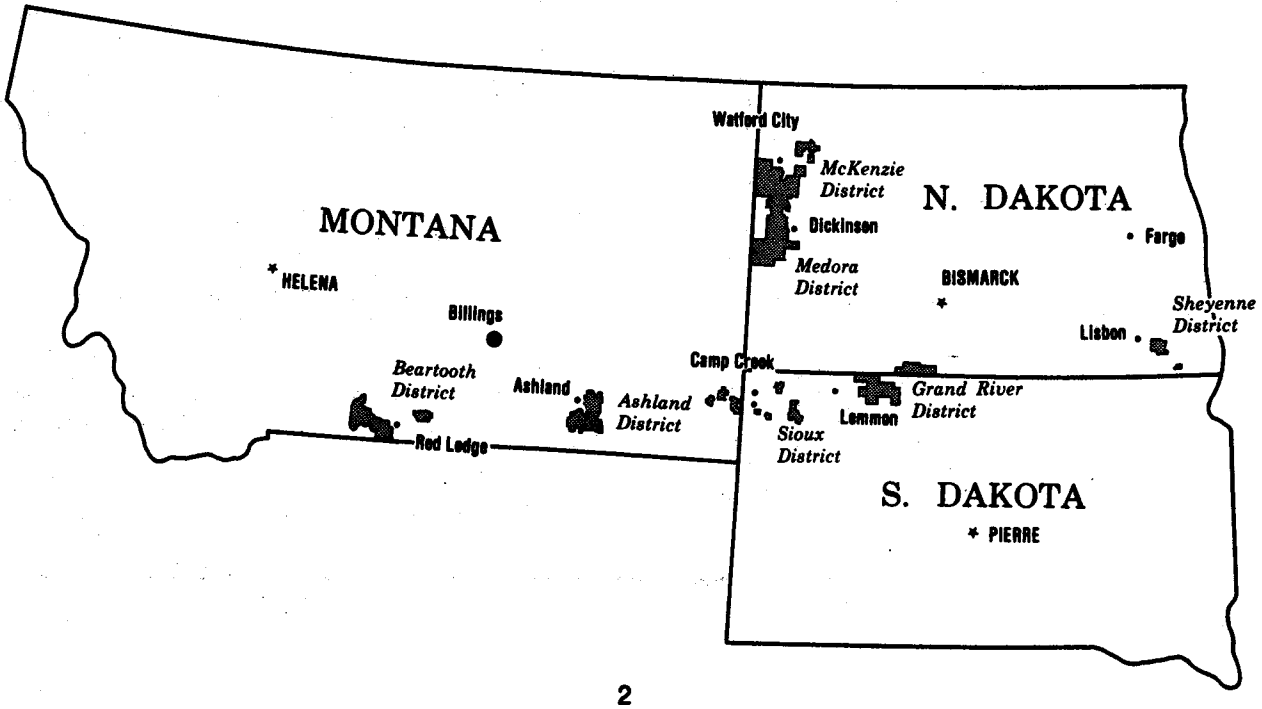
The gross area within the Forest's administrative and proclaimed boundaries is 3,999,679 acres. The net acreage of National Forest System land is 2,447,305 acres (61 percent), of which 1,187,187 acres are proclaimed National Forest and 1,260,118 acres are National Grasslands. Private landholdings are intermingled throughout the entire Forest, making up the 39 percent difference between the gross and net acreages. Many of these lands, particularly in the National Grasslands, are managed in coordination with the public lands under grazing permits. Distances across the Forest are 450 miles east to west and 240 north to south. Elevation ranges from 905 to 12,799 feet above sea level. There are a number of Indian tribes that are located in and around the Forest. There are no known treaty rights that effect the management of the Forest by legal mandate, but the Forest has recognized areas where traditional religious practices take place and provided for them in all alternatives.

The Absaroka-Beartooth Wilderness, covering 339,841 acres on the Custer National Forest in Montana, comprises 14 percent of the Forest's land base. The remaining acres of this Wilderness, about 575,000, fall under the jurisdiction of the Gallatin National Forest. In 1985, the Wyoming Wilderness Act added about 23,000 acres to the Absaroka-Beartooth within the Shoshone National Forest in northern Wyoming. The management of the Custer portion is addressed in this EIS.

There are no Montana Wilderness Act areas on the Forest, but three areas, Lost Water Canyon (Montana), Tongue River Breaks (Montana) and Twin Buttes (North Dakota), had been recommended for wilderness classification by the 1979 RARE II Environmental Impact Statement. The 1983 Lee Metcalf Wilderness Law (P.L. 98-140) released Tongue River Breaks from wilderness consideration in this Forest Planning effort. The other two areas as well as the other inventoried roadless areas (totaling 258,280 acres) are consid-

FIGURE I-1

Custer National Forest Ranger Districts



ered for various management strategies in the alternatives. The planning area also includes the adjoining roadless areas on the Gallatin National Forest (Montana) and the Shoshone National Forest (Wyoming). These shared roadless areas, North Absaroka (RARE II no. 01371), Beartooth (RARE II no. 01912), and Line Creek Plateau (RARE II no. 01911) are evaluated in their entirety in Appendix C. Recommendations for any additions to the wilderness system will be included in a separate report and record of decision transmitted by the administration to Congress.

D. Issues, Concerns, and Opportunities

The first of the 10 planning steps involves identification of issues, concerns and opportunities. Identification of these components helps determine what benefits people want in terms of goods, services, uses, and environmental conditions.

The Forest started public involvement for forest planning in May, 1981, by soliciting comments from the people on the Forest's mailing list. The initial mailing was sent to approximately 1,200 people. Comments were received from 179 people in 15 states. Additional information on development of these public issues is contained in Appendix A. These comments plus information from other Forest users were used to develop these five planning questions:

1. At what level of use and management intensity should livestock be managed on the Forest, considering public needs and demands for all resources?

2. In response to National demands for energy and strategic minerals, how can the Forest provide for mineral exploration and development while also providing for renewable resources?

3. How and where will the resource base, including riparian (stream-bank) zones and woody draws, be managed and protected for wildlife in view of competition from other resources?

4. What are the long-term public and resource management access needs and how should they be resolved?

5. What is the long-range need for wilderness, roadless, and low development areas and how should they be managed.

The Custer National Forest Environmental Impact Statement (40 CFR 1501.7) and the Forest Plan address these five major issues or "planning questions," as required by 40 CFR 1501.7 and additionally addresses the Management Concerns listed below:

1. Certain timber volumes from the forested Districts are needed to ensure a reasonable flow to the industry and for the enhancement of range forage and wildlife habitat.

2. Recreation opportunity needs to be evaluated across the Forest. Many rural areas depend almost entirely upon Forest Service facilities and National Forest System lands for public use. Conversely, recreation facilities and public lands near the metropolitan areas are also an integral part of the total public recreation opportunity.

3. The scenic beauty of the lands under the Custer National Forest's management is an important management concern. Existing Visual Condition is used to monitor the upper limits of the negative disturbance to the landscape. It is the goal of any management theme to maintain the natural character and beauty of the land as a response to public expectations and administrative policy.

4. The assessment of the total net public benefit is vital to the selection of the Proposed Action. This value includes all returns to society from the Forest, including priced and non-priced goods and services, employment and social programs less all costs.

5. The required budgets for each alternative in comparison to realistic expectations of Congressional actions are probably most critical to the success of the Proposed Action.

Additional public involvement was initiated in September 1983, to evaluate roadless areas for wilderness designation. As a result of the Ninth Circuit Court decision on the RARE II EIS (1982) and the subsequent revised NFMA regulations, 36 CFR 219.17, an evaluation of roadless areas for wilderness was required in the Forest planning process.

Private citizens were by far the greatest respondents (732), grazing permittees numbered 62, environmental/civic/conservation groups respondents totaled 58 and business/industrial comments amounted to 45. The remaining responses were divided among other categories: academic, Forest Service personnel, other Federal agencies, state and local governments, Indian tribes and Congress. Comments primarily concentrated on the Management Plan (668 responses) and secondarily on the Draft Environmental Impact Statement (280).

The complete replies to Federal and State agencies can be found in Chapter VI of this EIS. Replies to the remaining comments can be found in Appendix D and is available in the Supervisor's Office in Billings, Montana. Portions of the Appendix may be made available upon request.

For the purposes of brevity in this Chapter, the public issues and the management concerns have been combined into resource areas. A summary of the public comments received follows:

1. Wilderness and Roadless Management

Due to the the nature of the wilderness management/roadless managment issue, and the perception of some responding, it is almost impossible to separate the analysis of one (wilderness) from the other (roadless). From the way many of the commentors used the terms interchangeably, it was evident that to some, "roadless" and "wilderness" were synonymous.

This issue generated the greatest number of comments. Of the respondents, 691 specifically mentioned some aspect of "wilderness" management, while 383 specifically mentioned "roadless" management. By far, the majority of the comments received were directed to the roadless areas in North Dakota.

Some opposed adding any additional areas to the National Wilderness System. In the main, the oil and gas industry and livestock grazing permittees and/or grazing associations voiced the most opposition to wilderness/roadless management designation, implying that such a designation tended to preclude future options.

Most of the commentors supported either adding to the National Wilderness System or keeping the current areas in a roadless condition. Supporters for a wilderness or roadless designation justified this type of management because the areas include only minimal amounts of oil and gas or timber.

Others saw a need to retain some areas in an undeveloped status as a heritage to future generations. They viewed wilderness as being more permanent and long term than a roadless designation. The areas most commonly supported for classification in the National Wilderness System were:

- Twin Buttes (North Dakota)
- Lost Water Canyon (Montana)
- Line Creek Plateau (Montana)

2. Wildlife Management

Wildlife management, including Threatened and Endangered species, was another key issue for the Custer National Forest. This issue was directly related to other issues and concerns on the Forest. It was apparent that many respondents believed that the biggest threat to wildlife would come through the loss of roadless areas, oil and gas activities, livestock grazing, and timber harvest. Some commentors thought the problem of overgrazing and streambank degradation was severe enough to warrant fencing in some areas. Many cited timber management activities as adversely affecting wildlife habitat. Of those that commented, many spoke specifically in opposition to the timber management activities planned for the Lodgepole-Meyers Creek area on the Beartooth Ranger District and for the Long Pines area on the Sioux Ranger District.

Of those who opposed the emphasis on wildlife in the plan, livestock producers tended to perceive the emphasis as not in keeping with the intent of the Bankhead-Jones Farm Tenant Act. They suggested that livestock grazing should be the first priority and the livestock producers needed to be recogized as the ones who fed the wildlife in the winter time. They seemed to be saying that "we have nothing against wildife, but jobs and the ranching way of life are just as important."

3. Road Construction

The proposal to construct roads in support of Forest programs drew considerable comment (approximately 500). Commentors expressed concern about several "sub-issues" related to road construction, such as the amount of new roads planned and associated environmental impacts, road construction standards, economics, analysis within the Plan, and the closing of roads (road management).

Concern was expressed about the impacts on wildlife habitat, water quality, scenic beauty and recreation opportunities, suggesting that "dispersed, non-motorized recreation is what people want."

Proposed road standards were questioned by some. The oil and gas industry suggested that current design standards were too elaborate for oil and gas roads and that the Forest should make more use of "scratch-grade" roads, making reclamation easier and possibly more successful in the event a well proved to be dry.

The economics of road building and associated timber management activities drew criticism from some commentors. Some expressed the opinion that in most areas the timber values were not worth the cost of roading, and that "it is not fair to ask the public to subsidize the destruction of public lands."

Finally, several people said that the Plan needed to better identify which roads would be closed. Several expressed the opinion that new roads should be temporary in nature and closed after use.

4. Minerals (Oil and Gas) and Other Mining

Minerals management and specifically oil and gas continues to be one of the most volatile issue on the Forest. Virtually every other Forest issue originated from the effects, or perceived effects, of oil and gas activities. For example, those that commented as being against leasing mineral rights and oil and gas development cited adverse effects on the roadless resource, wildlife habitat, and special areas such as hardwood draws and the Greater Yellowstone Area.

There was strong public concern with both sides of the issue, including those who felt that the level of oil and gas production should remain at or near current levels. Proponents of increasing oil and gas development activities centered their comments on the belief that mineral management (oil and gas) can co-exist with other resource uses and activities. Many of those who commented in favor of oil and gas management activity supported maintaining the surface productivity of the land, but felt that jobs and the economic stimuli of oil and gas benefited the local and national economies. A sub-issue of mineral (oil and gas) management was administration and monitoring of these activities. Several commentors expressed the idea that they were comfortable with mineral management as a legitimate use of public lands, as long as close administration was continued.

5. Livestock Grazing

Livestock grazing continues to be a key issue for the Forest and it generated approximately 440 separate comments that directly spoke to livestock grazing. Again, from this issue, other issues emerged, such as management of woody draws.

Some folks thought the Plan was not doing enough to protect the environment from effects such as overgrazing; yet others thought that the Plan was too restrictive on livestock grazing in some management areas.

There was considerable criticism from the livestock industry and the grazing associations on the Forest's proposal to resolve conflicts in favor of oil and gas and/or wildlife in certain management areas. The livestock producers and grazing associations also expressed the opinion that the proposed Plan departs from the multiple-use concept of management and the intent of the Bankhead-Jones Farm Tenant Act (which relates to the National Grasslands portion of the Forest). Generally, those who supported livestock grazing and intensive management did not believe the level of livestock grazing should be increased. On the other hand, they did expressed the feeling that if "push came to shove," livestock should be considered as a high priority.

Generally, the opponents of increased livestock grazing centered their comments on the adverse environmental/economic effects of livestock grazing on the envirionment. One of the often mentioned reasons for opposing any increase in the level of livestock grazing was its perceived effect on riparian areas or hardwood draws and watershed quality.

6. Recreation Management

Although recreation management had not been previously identified as a major Forest issue, the comment analysis revealed over 400 comments specific to some aspect of recreation management. By far, the majority of these comments expressed a concern over the reduction in roadless areas and the perceived effects of this on dispersed, non-motorized recreation.

Many of the commentors expressed the opinion that oil and gas, timber activities, and road construction posed the biggest problem to the Forest in respect to future recreation opportunity. It was evident that many of those that responded believed that the future demand would be for dispersed, primitive, non-motorized activities such as back-packing and hunting. This opinion seemed to be especially prevalent in the responses from people in North Dakota. Some of the respondents from Montana stated that the economic base of the town of Redlodge, Montana is recreation and tourism.

Although there was some support for new developed sites, such as campgrounds and trails, most felt that the greatest problem facing the Forest was the lack of funding for adequate maintenance and keeping the sites open for the entire season.

A few comments were received that expressed the opinion that the proposed Forest Plan placed too much emphasis on recreation. Some suggested that more areas should to be opened for exploration of oil and gas and that maintaining roadless areas created "de facto" wilderness which could only be used by certain groups of people. Others stated that the National Grasslands were agricultural in nature and livestock grazing and the needs of the ranching community should be considered.

7. Riparian and Woody Draw Management

The management of riparian areas and woody draws was identified as a major issue during the issue identification process. This was validated during the public comment period. Approximately 150 individual comments were received which spoke directly to the issue of management of riparian areas or woody draws.

Those that expressed an opinion concerning this issue were unanimous in two respects. First of all, the commentors said that these areas are extremely important for a variety of reasons and deserve special protection and/or management. Secondly, it was evident that the commentors believe the cause of the problem in these areas is due to overgrazing or the improper management of domestic livestock. Numerous people expressed a concern about impacts to wildlife habitat, water quality, and recreational opportunities. Generally speaking, it seemed that most people appreciated the Forest Plan's special acknowledgement of these areas, albeit some thinking it was too restrictive and others thinking it was not restrictive enough.

8. Timber Harvesting

Although the timber harvesting program on the Custer National Forest is not a major resource

program within the Northern Region, this issue generated over 400 comments. Several of the other issues such unwarranted manipulation of wildlife habitat originated from the timber harvesting issue. Many felt that the proposed increase harvest levels were simply out of line and not justified. An extremely sensitive issue surfaced in regard to the timber management in the Long Pines on the Sioux Ranger District and in Lodgepole Creek on the Beartooth Ranger District. The commentors who spoke directly to the Long Pines felt that the areas was too valuable as deer habitat to support any further harvesting. Lodgepole Creek was seen by those directly affected (local residents and ranch guests) as having greater value for wildlife and scenery, in addition to the steep topographic situation.

Proponents of increasing the timber harvest centered their comments on the need to increase the timber supply to local mills to sustain jobs and to bolster local economies. Many of those who supported increased timber harvest were livestock grazing interests. They expressed the need to harvest timber in order to increase forage production for wildlife as well as domestic livestock.

E. Summary of Changes Between the Draft and Final

1. Introduction

Following publication of the Draft EIS and Proposed Forest Plan in April of 1985, the Forest held a number of public meetings as well as solicited written public input. A summary of public input is included in Chapter VI which includes responses to state and federal agencies, elected officials, and Indian tribes.

All other public comments are reproduced and responded to in Appendix D. The combined input from all comments was the source of many of the changes made between the Draft and final EIS.

The changes made between the Draft and final EIS include;

— Changes in the documents and maps as a result of public comment.

— Changes as a result of Forest Service reviews.

2. Changes in Documents and Maps as a Result of Public Comment

Changes to the EIS

The Final EIS reflects public comments, primarily by proposing a new Alternative 10, as the Preferred Alternative.

Changes to the preferred alternative

The preferred alternative responds to the concerns of roadless area management, timber harvest and livestock grazing levels. The Forest Plan reflects revised management direction, monitoring requirements, and clarification of goals. The maps accompanying the Forest Plan reflect the changes in land designation. Generally speaking, more lands were included in wildlife-emphasis management, reducing the amount in timber, grazing or minerals-emphasis. Three additional roadless areas were identified in North Dakota, removing those lands from other management themes.

Alternative 10 can be considered as a modification of Alternative 6, as most of the original components remain the same. Alternative 6 is retained in the Final EIS, so that comparisons can be made.

a. Livestock Grazing

Changes to the EIS

Livestock grazing remained virtually unchanged in the EIS except that the grazing outputs in the preferred alternative are lower in the future than was proposed in Alternative 6 (Proposed Action).

Changes to the preferred alternative

As a result of public input, the proposed level of domestic livestock grazing was changed in the preferred alternative between the Draft to the Final. Originally, an increase was provided in permitted animal unit months, beginning at 875,000 AUM's and increasing over time. In the Final, the number of animal unit months will remain at approximately 875,000 AUM's, although there is a slight dip in the short-term to alleviate some unacceptable situations. There will continue to be adjustments in livestock numbers and season of use on an allotment by allotment basis.

The wording of some Management Area goals was changed between the draft and the final. The original wording was unacceptable to some as they interpreted it that some resources would be managed as a dominant use. This wording was "... conflicts will be resolved in favor of..." This has since been reworded with the assistance of those concerned to indicate that parties affected by conflicts not easily resolved will be consulted.

b. Timber Management

Changes to the EIS

The Draft EIS originally contained a harvest volume of 6.0 MMBF per year for the preferred alternative, the errata sheet included with the public mailing corrected this to 4.0 MMBF per year. The Final EIS indicates a harvest volume of 3.0 MMBF per year for the preferred alternative. The timber harvest volume, and method of harvest has been revised to reflect wildlife habitat concerns.

This proposed level of timber harvest will meet the needs of local mills that have traditionally depended on timber from the Custer National Forest. If mills from outside the traditional area of

lumber manufacturing buy sales offered by the Forest, local mills may have to find additional sources of timber.

The Forest has sold a number of timber sales in the past that could be considered below-cost. These sales provide the financing to construct roads that will be available for future timber harvest as well as other resource uses in the future. This point is clarified in the final EIS.

The final EIS also was revised to add more information on uneven aged management of timber. Additional analysis of even aged and uneven aged management was done between the draft and the final and timber yield tables included in the model when alternatives were rerun. Uneven aged silvicultural system will be used in some management areas to meet multiple use objectives.

Changes to the preferred alternative

The major concern with the proposed 4.0 MMBF level of timber harvest was the potential impact on big game species and the construction of additional roads. Of particular concern to many were the proposed harvests levels in the Long Pines area of the Sioux Ranger District and the Lodgepole Creek timber sale on the Beartooth Ranger District. Under the direction of the Final Plan, only about one-half of the Forest's tentatively suitable timber lands are considered for timber management in the long-term. The harvest levels for the Long Pines area has been reduced and the Lodgepole Creek Sale has been dropped. As a result in fifty to seventy-five years, almost half the Forest's suitable timber lands will contain old growth stands and losses due to mortality will be quite high.

c. Wilderness and Roadless

Changes to the EIS

Between the draft and final a re-evaluation of areas that may be suitable for roadless management was made with the help of selected publics. This re-evaluation helped identify additional areas to be included in the preferred alternative.

Changes to the preferred alternative

The Draft preferred alternative proposed five ares for low development management, three in Montana and two in North Dakota, As a result of public involvement, three more areas were added to this designation in North Dakota. Therefore, eight areas now are designated as Low Development Areas (Management Area J):

Montana:

1. *Tongue River Breaks*
2. *Cook Mountain*
3. *King Mountain*

North Dakota:

1. *Lone Butte*
2. *Bennett-Cottonwood*
3. *Horse Creek — new*
4. *Long-X Divide — new*
5. *Twin Buttes — new, formerly Recommended Wilderness*

Wilderness proposals in the Draft preferred alternative included the Lost Water Canyon and several small additions to the Absaroka-Beartooth Wilderness. Some comments were received indicating that more area needed to be recommended. The original proposals remain unchanged as it was determined that most of these lands could best meet long-term multiple use objectives if they were not classified as wilderness.

d. Wildlife Management

Changes in the EIS

The wildife section was strengthened and added too as additional information was available. This was primarily related to threatened and endangered species.

Changes to the preferred alternative

The preferred alternative contained substantial wildlife direction. On the whole, this direction remains unchanged in the Final. The reduction in harvest levels was in response to many and varied wildlife concerns, including those of several state Departments of Fish and Wildlife. Likewise, part of the decision to limit the upward trend in livestock grazing was the potential impact to wildlife habitat. The direction for woody draws and riparian areas has remained unchanged. The size and number of wildlife emphasis areas was increased in response to public input.

e. Minerals (Oil and Gas) and Other Mining

Changes to the EIS

The minerals section has been expanded to provide the reviewer a better understanding of the existing oil and gas situation. The minerals section was reorganized so it is more readable and provided considerably more information. The EIS now contains informations such as how many acres are leased, how many acres are held by mineral production, and the total number of leases as well as the number of leases held by production.

Changes to the preferred alternative

Minerals management direction in the preferred alternative is relatively unchanged, although the additional low development areas restrict oil and gas exploration and development. These new designations, however, were made for areas with expected low mineral potential.

f. Comments Which Offered Technical Corrections, Pointed Out Inconsistencies, or the Need For Clarification

These have been checked and used to revise the documents or maps where applicable.

3. Changes as a Result of Forest Service Reviews

a. Document and Map Corrections

Maps of the preferred alternative were revised as a result of public input and also to avoid private lands within special emphasis area where possible. Not all private land was eliminated from these areas, but boundaries where changed where reasonable.

b. Additional Information

In the EIS the wildlife section was added to as some changes in the threatened and endangered species section was needed. In the preferred alternative additional information was added to the wildlife section as it became available. The list of sensitive plant and animal species was added to based on additional information from the public and internal sources. Additional information has been added that puts the plan into perspective. Some of these required statements are:

> *"This Environmental Impact Statement (EIS) documents the analysis and discloses the significant environmental effects of a Proposed Action (Preferred Alternative) and other alternatives for the future management of land and resources of the Custer National Forest. The proposed action is the basis for the Forest Land and Resource Management Plan (Forest Plan) which is described in a separate document. The Forest Plan will guide management of the Forest for the next 10 to 15 years unless conditions or demands significantly change. The analysis in the EIS projects outputs and effects for up to 150 years to indicate the long-term implications of continuing with the plan. While long range effects have been estimated, the plan is valid until it is revised, committing the Forest to a course of action no longer than 15 years."*
>
> *"Development of this EIS and Forest Plan followed direction from the Forest and Rangeland Renewable Resources Planning Act (RPA), the National Forest Management Act (NFMA), and the National Environmental Policy Act (NEPA). Further direction was given by the implementing regulations of NFMA (36 CFR 219) and NEPA (40 CFR 1500-1508). The analysis in the EIS and Forest Plan are designed to ensure multiple use and provide a sustained yield of goods and services from the Forest to maximize long-term net public benefits and address public issues in an environmentally sound manner."*
>
> *"Timber harvest acreage figures do not represent acreage targets by method for alternatives." Rather, they are the levels projected by the Forest planning model that represents the appropriate ways of meeting the objectives and constraints of each alternative. Qualify that "final determination of what silvicultural system will be used for a particular project will be made by a certified silviculturist after an on-the-ground site analysis."*
>
> *In the Forest Plan the Vegetative Management Appendix makes the following points. Vegetative management practices, i.e., silvicultural systems, chosen or available for each vegetative type are outlined. The circumstances in which these practices apply are described as well as the reasons for the application.*
>
> *"The final decision for the vegetative management practice (silvicultural system) chosen for each vegetative type and circumstance shall be made by a certified silviculturist using guidance in this appendix, a review of applicable technical and scientific literature, and practical experience. Using this knowledge, the silviculturist will evaluate the practices for relevance to the specific vegetation and site conditions."*

Chapter IV has been revised so it is more site specific to the Custer National Forest situation instead of general. Numerous changes in numbers have been made throughout the document to correct errors found in the draft.

F. Reader's Guide

The remainder of the FEIS is organized in the following manner:

Chapter II describes alternatives by showing the resource outputs, costs, benefits, and major effects of meeting the objectives of each alternative. The environmental, economic, and social effects of alternatives are briefly compared.

Chapter III provides a brief discussion of the existing condition of physical, biological, social, and economic components of the environment that may be affected by Forest management.

Chapter IV identifies the environmental consequences which could result from Forest management activities scheduled in each alternative.

Chapter V lists the people involved in the collection of data, management decisions and preparation of the documents.

Chapter VI is the list of agencies, organizations, elected officials and to other parties to whom planning information, requests for inputs, and finished draft documents are sent. Additionally included in this Chapter are the Forest's responses to the comments received from state and Federal agencies, elected officials and Indian Tribes.

Chapter VII is the glossary which contains definitions used in Forest planning and other technical terms.

The Appendices to the Environmental Impact Statement are as follows:

Appendix A — Issues, Concerns and Opportunities Identification Process

Appendix B — Description of the Analysis Process

Appendix C — Roadless Area Evaluation

Appendix D — Public Comments and Forest Replies

Appendix E — Threatened and Endangered Species Biological Evaluation

Planning records, the documents and files which chronicle the first seven planning steps, are available for inspection at the Forest Supervisor's Office, 2602 First Avenue North, Billings, Montana.

CHAPTER II
ALTERNATIVES

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ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. Introduction

This chapter presents the development, description and comparison of alternative ways of managing the Forest's land and resources. The development process involves an analysis of the management situation which includes a determination of minimum and maximum resource and value potentials. This step identifies the capabilities of the Forest (see Section B, below, Item 2, Analysis of the Management Situation).

The alternative descriptions identify the objectives of each alternative, explain how the alternative was formulated and how it responds to issues and management concerns. This discussion includes resource and economic results (see Section C, Description of Alternatives). Section D, Comparison of Alternatives, compares alternatives by resource outputs, social and economic effects, response to major issues, and nonpriced benefits.

B. Alternative Development

1. Overview

Forest planning begins by identifying public issues and management concerns. Refer to Appendix A for a description of this process. Once the issues are known, information is needed to determine the Forest's capability to respond to each issue. This step is called the Analysis of the Management Situation, and resource data, economics information, and environmental/legal constraints are examined. Benchmarks are developed and analyzed to measure resource and economic interrelationships and output ranges for alternative development.

Alternatives are developed that respond to issues, present net value (PNV), and net public benefits (NPB). A single numeric NPB value is not calculated because monetary values associated with some resources, such as timber, cannot be added to the qualitative value of nonpriced benefits like a scenic view. An understanding of the various types of values and interrelationships associated with Forest outputs aids decisionmakers in the selection of an alternative that maximizes net public benefits. Present net value represents the dollar difference between the discounted value of all priced outputs and all Forest costs over the 75-year planning horizon. Two discount rates, 4 percent and 7⅛ percent are used as an annual percentages by which future benefit and costs are discounted in value to represent a base year (1978).

Priced outputs include those outputs with market values (timber, range forage, and oil) and those outputs with assigned nonmarket prices (recreation, and wildlife and fish user days). Contrasted to these outputs are the nonmarket outputs that have neither a market price nor an assigned price. These include outputs such as employment, visual quality, wilderness, roadless, water quality, and wildlife populations. (See the glossary for definitions of PNV and NPB and Appendix B, Section IV, for a further discussion of NPB.)

The alternative development process is outlined in 36 CFR 219.12. These regulations include the following goals for alternative formulation:

a. Provide basis for identifying the alternative that maximizes net public benefits.

b. Distribute the alternatives between the minimum and maximum resource potential and reflect a range of environmental resource uses and expenditure levels.

c. Analyze the opportunity costs and tradeoffs.

d. Evaluate the effects on present net value, benefits, and costs.

e. Provide different ways to respond to major public issues.

See Section VII of Appendix B for greater detail about the alternative development process.

Summary of Changes Between the Draft EIS and the Final EIS

One additional alternative was developed in response to public comment, internal analysis requirements, management concerns and refinement of existing data and assumptions. The new alternative was developed from Alternative 6 and is identified in this Final EIS as Alternative 10, the Preferred Alternative. Supporting narratives, outputs, and comparisons for this alternative have been added throughout this document in the appropriate sections.

In response to public comment and internal concerns, the analysis and discussion of economic costs, benefits, and net public benefits of and between alternatives has been expanded. This has resulted in some rearrangement of the discussion in Chapter II (see Section D parts 16 through 18) as well as the addition of a number of tables and figures.

As a result of public comment, some changes have been made in acre designation in Alternative 10, the preferred action. This resulted in some minor changes in management area boundaries

with some additional areas assigned to Management Areas C and D. This has resulted in some minor changes in timber harvest levels and the level of livestock grazing. Timber harvest was reduced from 4.0 MMBF to 3.0 MMBF annually. Livestock grazing will remain at or near the current level of 875,000 AUM's annually instead of increasing slightly as previously projected under Alternative 6.

The discussion of threatened and endangered species in Chapter II of the EIS has been updated to include the piping plover. Also a table has been added in Chapter II concerning the grizzly bear that shows for the major owners within the Greater Yellowstone Area the recovery goals, potential, and the numbers of bears under the preferred alternative.

In response to public comment concerning minerals management and specifically oil and gas, the discussion in Chapters III and IV has been greatly expanded to clarify the existing situation on the Forest and the analysis that was done concerning oil and gas leasing.

Public comments from the states of North Dakota and South Dakota were received concerning research natural areas and sensitive and/or unique plant and animal species. A habitat classification for most of the Custer National Forest is still in the process of development and was not available during the development and assignment of RNA targets through the Northern Regional Guide. The Forest Plan identifies some possible future candidate areas and allows for their evaluation as possible RNA's in order to represent some of the unique vegetative classes that may be identified in the habitat classification presently under way.

Many of the public comments concerned the roadless/wilderness issue. In response to the public comment concerning this issue, the Forest did some extensive analysis on the roadless areas identified in the 1983 roadless inventory update. This analysis centered on land and mineral ownership patterns, mineral potential, existing mineral leases, and size. This analysis resulted in the identification and designation of two additional areas (Horse Creek, Long X Divide) as low development areas. In addition one area (Twin Buttes) from the 1983 roadless inventory has been designated as a low development area. These areas totalling approximately 32,000 acres have been included in Management Area J in the Final Forest Plan and EIS.

Additional correction of errors in the text, tables, and figures have also been made as a result of public comment and extensive internal review. Tables and figures have been renumbered to conform with the new organization of Chapter II.

2. Analysis of the Management Situation

The analysis of the management situation is used to determine resource supply potentials by establishing minimum and maximum production levels called benchmarks. A level is also established from which the costs and effects of applying regulation and policy constraints can be measured. Production capabilities are determined for single resources and for a set of multiple resource outputs that maximizes present net value. This analysis establishes the benchmark levels that are required by NFMA regulation 219.12e.

a.Benchmark Levels

Ten (10) benchmarks levels are developed to define resource supply potentials and economic relationships of the Forest. Production capabilities are determined for a minimum level, for single resources and for a set of multiple resource outputs that maximize present net value (NFMA regulation 219.12e). A level is also established from which the costs and effects of applying regulation and policy constraints are measured. The computer model FORPLAN was used to help determine the resource supply potentials.

The benchmark levels and analyses are summarized in this chapter. Appendix B, Section VI, provides a detailed discussion of the benchmark levels.

1) Constraints

Regulation and policy constraints applied to benchmarks have, in most cases, the effect of reducing the maximum resource supply potential. NFMA regulation 219.27 specifies that certain minimum management requirements be included in the planning process. The methods used to meet these minimum management requirements include developing standards and guidelines and appropriate management practices for management prescriptions, assignment of management prescriptions and intensities to analysis areas in FORPLAN and applying specific constraints in FORPLAN. A complete description of the minimum management requirements can be found in Appendix B, Section VI. The constraints commonly applied to the benchmark levels, except for the minimum level benchmark, are listed below:

a) All management prescriptions available for benchmark analysis provide for the protection of basic soil, air, and water resources.

b) A minimum level of the existing wilderness acres (339,841) is maintained in all benchmarks.

c) All management prescriptions available for benchmark analysis provide for the maintenance of minimum viable wildlife populations.

d) The management prescriptions pro-

vide for the requirements of known threatened and/or endangered wildlife species.

Other constraints that were applied to only certain benchmarks are listed below:

e) A timber harvest, nondeclining sustained yield constraint was used in the maximum timber, maximum wilderness, and the maximum market values benchmarks.

f) A timber ending inventory constraint was used in the maximum timber, maximum wilderness, and the maximum nonwilderness benchmarks.

g) Timber harvest flow, using sequential bounds of 10 percent decrease and a 20 percent increase, were used in the current direction and current future benchmarks.

h) A timber harvest level constraint was used in the maximum wildlife benchmark in order to insure an optimum wildlife cover/forage ratio and to provide for big game winter and summer range requirements.

i) The current level benchmark also utilized budgetary constraints to determine the level of outputs that would be produced at current budget levels.

j) The minimum level benchmark was constrained to produce no management induced outputs such as oil, timber, and grazing to determine the basic cost of Federal ownership.

Further discussion of constraints can be found in Appendix B, Section VII.

2) Benchmark Descriptions

a) Maximize Present Net Value (Benchmark PNV)

This benchmark establishes the mix of resource uses and schedule of outputs and costs that maximize present net value using market and nonmarket assigned values. Minimum management requirements are met. There are no constraints on the timber harvest volume or flow. Although this benchmark is not carried forward as an alternative, information from it is used to help develop Alternative 3. This benchmark is displayed in the DEIS where a comparison of alternatives is made in order to provide a reference to the maximum present net value potential considered.

b) Maximize Timber (Benchmark TMA)

The maximum legal capability of the Forest to produce timber is determined by this benchmark. Timber production is maximized in decade 1 based on nondeclining flow and meeting minimum management requirements. This benchmark is not carried forward as an alternative because it does not adequately provide for multiple uses. It also is not responsive to the Forest issues and concerns. However, this benchmark is used to develop and test the range of alternative timber outputs.

c) Maximize Deer Habitat Potential (Benchmark WLD)

The purpose of this benchmark is to determine the greatest potential capacity in terms of effective habitat for deer. This maximum potential is established, based on forage production and optimum forage/cover ratios produced through the reduction of competing uses and on optimum timber harvest levels. This benchmark establishes the maximum potential capacity for deer, but is not carried forward as an alternative since it does not adequately provide for multiple resource uses. It is used to help develop potential capacity in several of the alternatives.

d) Maximize Livestock Forage (Benchmark RGE)

This benchmark is designed to determine the maximum production of domestic livestock grazing, considering only the minimum management requirements for the soil, water, and vegetation. Information from this benchmark is used to develop Alternative 2 (RPA). This benchmark is not carried forward as an alternative because of high costs, adverse effects to wildlife, and limited response to other resource issues and concerns.

e) Maximum Recreation (Benchmark RVD)

Recreation designations is maximized to analyze the potential of the Forest to produce recreation visitor days (RVD's), considering only the minimum management requirements for soil, air, and water. The benchmark is eliminated from detailed study because it does not adequately respond to the other resource issues and concerns.

f) Maximum Wilderness (Benchmark WAL)

Wilderness designation is maximized in order to determine the benefits, costs, outputs and opportunity costs of wilderness. This benchmark is not carried forward as an alternative, but it is used to formulate alternatives 5a, 5b, 5c, 6, 6a, 6b, 7b and 7c.

g) Maximum Oil Production (Benchmark OIL)

This benchmark established the maximum limits of the Forest to produce oil while meeting minimum management requirements for soil, water, and vegetation. This benchmark is not carried forward as an alternative because it produces unacceptable impacts on fisheries, wildlife, and local economies. The output levels are used in the formulation of alternatives 7, 7a, and 7b.

h) Maximum Market (Benchmark MIT)

The purpose of this benchmark is to provide a comparison of the changes in designation and

scheduling based solely on the values of the market outputs of grazing, barrels of oil, and timber harvest, and to determine the effects of nonmarket values on PNV. This benchmark is not carried forward as an alternative because it does not value the nonmarket outputs, such as recreation and wildlife. This benchmark is used as an analysis tool in the comparison of the alternatives.

i) Minimum Level (Benchmark MIN)

This benchmark defines the cost associated with public landownership and the resource outputs which are incidental to Forest management. This benchmark is not carried forward as an alternative, since it does not provide for multiple use, and because it is outside the jurisdictional authority of the Forest Service. It is used to compare inevitable costs and outputs of public ownership to those outputs induced through management direction and activities.

j) Current Direction (Benchmark CUF)

This benchmark defines the current level of goods and services expected in the future if existing unit plan management direction is followed with no budget constraint. This benchmark is not carried forward as an alternative; however, it is used to formulate Alternative 5 (No Action).

Three other benchmarks were developed that are variations of the above. These benchmark levels examined the following concepts in relation to current direction: no additional wilderness, timber harvest at cumulative mean annual increment (CMAI), and current direction with a budget constraint. They are described in detail in Appendix B, Section VI.

b. Benchmark Analysis

Analysis of the benchmarks establishes upper and lower potential production levels for selected resources. Additional analyses were made to estimate projected use levels. The following resources were analyzed:

1) Recreation

The Forest's current recreation use is 748,125 Recreation Visitor Days (RVD's). These span the Recreation Opportunity Spectrum (ROS) classes of Primitive (P), Semi-Primitive Non-Motorized (SPNM), Semi-Primitive Motorized (SPM), Roaded Natural Appearing (RNA), and Rural (R) (FSH 1909.12, Chapter 500). There is no urban class of use on the Forest. Recreation use is also categorized into major groupings of developed and dispersed recreation which include all or some of the ROS classes.

2) Developed Recreation

Developed recreation sites, including campgrounds, picnic sites, organizational camps, recreational residences and a ski area, are adequate to meet projected use until 2010, at a capacity of 524,500 RVD's. Recreation use at these sites is currently 263,145 RVD's. Additional capacity can be developed at the existing sites after 2010. In addition, lands are available for designation to developed recreation when use warrants it.

3) Dispersed Recreation

Dispersed recreation use, not including wilderness use, is currently 484,980 RVD's. The Forest's lands are capable of providing a total capacity of 2,750,100 RVD's. Projected use is not expected to exceed capacity, although the acres currently available for semiprimitive non-motorized recreation use will decrease over time if more lands are roaded.

4) Wilderness

The Forest currently has 339,841 acres of wilderness which has a capacity of 169,900 RVD's of primitive recreation. Current use is 150,700 RVD's and capacity is expected to be reached by 1990. There are an additional 241,700 acres of National Forest roadless lands available for wilderness consideration in the maximum potential benchmark which would result in an additional 77,484 RVD capacity. This additional capacity would meet projected use until 2019.

5) Livestock Forage

The analysis of the resource benchmarks establishes upper and lower livestock forage production levels. The minimum level benchmark (MIN) would phase out livestock grazing on the Forest. In contrast to this the maximum range benchmark (RGE) indicates a grazing capacity of approximately 1,122,000 AUM's in 50 years. Permitted use was 865,500 Animal Unit Months (AUM's) of domestic livestock grazing in 1983 which is accomplished on approximately 1.62 million acres of suitable range.

The opportunity to provide for the grazing of livestock depends on range management practices, timber management practices, and/or the degree to which available resources are committed to forage production.

Demand for permitted livestock grazing is expected to increase to the extent to which livestock grazing is made available. This is primarily due to the private land base availability within the Forest's zone of influence, and to the use of this private land for agricultural and grazing purposes. Lands administered by the Forest complement these private ranching operations and tend to "round out" the forage availability to support year-round management. Because of this, it is estimated that a significant increase in grazing fees would not result in a portion of the potential supply going unused.

6) Deer/Elk

Deer are the most important big game animal on the Forest. They are widely distributed and are closely tied to the riparian/woody draw zones. Management activities that disturb and/or disrupt these areas have the greatest effect on both white-tailed and mule deer.

The Beartooth Ranger District has the major elk herd, numbering approximately 960 in 1980. This herd generally spends the summer months in high elevations and uses winter ranges that extend onto private ownerships. A small herd of elk (approximately 125-150 head) exists on the Little Missouri National Grasslands in North Dakota.

Charts showing the provided capacity for deer and Montana elk can be found in Section D, Alternative Comparisons.

Current big game recreation visitor days are approximately 70,470 and projected use is expected to increase to 127,000 by the fifth decade. The total wildlife-related recreation use can be found in the large matrix at the end of Chapter 2.

7) Oil

With the exception of the Sheyenne Ranger District, the Absaroka-Beartooth Wilderness, Lost Water Canyon and the Pryor Mountains of the Beartooth District, nearly all of the lands on the Forest are currently leased for oil and gas or have leases pending. Currently, there are 49 oil fields within the administrative boundaries of the Forest, with an estimated annual production of 15 million barrels of oil. The Maximum Oil Benchmark (OIL) forecasts an accumulative production of 350.9 million barrels of oil over the planning horizon, with production ending in the fifth decade. Demand for energy resources is expected to increase to the extent that these resources are available.

8) Fisheries

Most of the 333 miles of streams and 5,713 acres of lakes on the Forest capable of supporting fish occur on the Beartooth District. However, many of these stream miles are in the wilderness and are affected little by Forest management activities. There is a resident native strain of cutthroat trout population in some of the upper reaches of these streams. Trout in the streams, lakes, and ponds outside of the wilderness can be affected by management activities. These fisheries are affected by changes in the amount of sedimentation caused by timber harvest, road construction activities, livestock grazing, and stocking procedures.

The current cold water fish population is estimated at 406,250 catchable trout. The potential, which is based upon stocking all suitable lakes and ponds as well as altering habitats through structural and nonstructural improvements, is estimated at an additional 126,000 catchable trout.

The Forest provides warm water fish habitat potential on all Districts except the Beartooth District. These areas are principally stock ponds that meet fish survival requirements. It is estimated that there are 150 acres of ponds with a warm water fisheries that provide approximately 22,500 catchable fish. The potential is estimated at an additional 97,500 catchable warm water fish.

These two types of fisheries would provide an opportunity for over 652,000 catchable fish on the Forest.

9) Timber

Although timber management is not a major resource program on the Custer National Forest, the Forest does have an opportunity to provide a portion of the local mill demand in the Forest's zone of influence. The average annual volume of timber offered and sold from 1980-1985 was approximately 2.0 MMBF. This volume was somewhat higher than the 1.2 MMBF offered and sold during the period of 1976-1979.

a) Demand

The Forest has an opportunity to manage for increased or decreased levels of timber production. With a few exceptions, the typical timber mill in the Forest's zone of influence is small with a mill capacity from 1 to 5 MMBF annually. However, recently mills as far away as Rapid City, South Dakota and several mills in northern Wyoming have demonstrated an interest in timber from the Forest, bidding on a significant portion of sales offered. When these mills are considered, the total mill capacity in the area would be approximately 155 MMBF. However, this is not a realistic expression of timber demand for the Forest. In the recent past two mills in the Ashland, Montana area have been closed due to the depressed economics in the timber sector of the economy. It is impossible to predict if and when the Ashland mills will reopen. Also, the extremely long haul distances to mills in western South Dakota and northern Wyoming will preclude many of these mills from securing a significant portion of their timber demand from the Forest. However, under the right economic situation they would depend on the Custer Forest for at least a portion of their mill capacity. Additionally, some of the mills in the area such as the mill in Lame Deer, Montana have relied totally on non-Forest timber to meet their needs. The largest mill within the Forest's area of influence is Pope and Talbot, Inc. of Spearfish, South Dakota with an estimated mill capacity of 100 MMBF annually. Recently the owners of this mill have bid on and purchased timber sales on the Forest. The majority of the capacity of this mill will be met with timber from other National

Forests. However, it is reasonable to assume that a small portion of the capacity of this mill could be met by the Custer Forest.

It is estimated that the realistic mill capacity for the Custer National Forest zone of influence is from 12-16 MMBF annually.

b) Supply

The Forest is capable of exceeding current harvest levels and RPA objectives by increasing timber management funding levels and/or through increased designation of lands for timber management emphasis.

Approximately 157,000 acres are classed as tentatively suitable for timber production. The land base tentatively suitable for timber production has the capacity to meet all RPA targets for the next 50 years. By maximizing timber production, (Maximum Timber Benchmark), the Forest can produce 13.6 MMBF per year in the first decade with a sustained yield of 13.6 MMBF per year. There is no timber harvest under the minimum level benchmark. Benchmark PNV maximizes PNV but does not harvest timber for 25 years. In the Maximum PNV Benchmark only 38,000 acres were designated as suitable indicating that in the short-run timber management on most sites on the Forest is not cost efficient.

Lands suitable for timber management range from no acres in Benchmark MIN, to 29,300 acres in maximum timber production (TMA) in the first decade and 16,000 acres in the current direction (CUF) for the same period of time.

10) Present Net Value

The maximum PNV of the Forest is $4.2 billion as defined by Benchmark PNV which meets minimum management requirements and precludes timber management from existing wilderness.

11) Discounted Cost

The minimum total discounted cost of $33 million is represented by the minimum level benchmark (MIN).

12) Employment

Employment in the Forest's zone of influence in 1980 was 235,141 jobs. This ranges from 234,233 (loss of 908 jobs) in Benchmark Minimum Level to 238,487 (gain of 3,346 jobs) in Benchmark PNV.

3. Range of Alternatives

a. Information Used to Develop Alternatives

In developing alternatives, the benchmark analysis defines the decision space within which alternatives can be developed. For example, the timber and minimum level benchmarks show that the timber base sale levels can range from a minimum of zero to 13.6 MMBF per year in the first decade. Alternatives were then designed to span the benchmark range while meeting policy constraints such as riparian area protection and minimum acceptable harvest levels. The PNV benchmark is used to determine differing effects of emphasizing various outputs and provides a basis for changing alternative activities to optimize PNV while still meeting the objectives. The current direction benchmark is used to develop the current program or the "no action" alternative.

The benchmark analyses also helps to address the broad range of public issues and management concerns. The issues and concerns center around livestock forage production, mineral exploration and development, woody draws and riparian area's importance to wildlife, habitat for wildlife, road access to the Forest, and low development areas.

The range of alternatives includes emphasizing resources that are priced and have market outputs to those alternatives emphasizing the nonpriced, nonmarket outputs. Each alternative is formulated so that multiple resource use occurs. The difference between alternatives and how well each alternative responds to the issues and concerns is reflected in the amount and emphasis place on the individual resources.

b. Adequate Range of Alternatives

An adequate range of alternatives was developed by first designing those that were required by the June 7, 1983, Regional Forester's letter regarding procedural direction. The roadless area evaluation principles (NFMA 36 CFR 219.17 were also followed to develop a range of roadless designation between all wilderness and all nonwilderness. With the exception of Tongue River Breaks, each roadless area is designated to wilderness in at least one alternative. One alternative designates the roadless areas (except Tongue River Breaks) as wilderness and evaluates the opportunity for increasing commodity outputs on roaded lands. Another alternative is designed to meet RPA targets identified in the Regional Guide. These alternatives were as follows:

1) Current program (Alternative 8) — continuation of current policies and current budget changed for changing costs over time.

2) Market emphasis (Alternative 7) — emphasis on outputs that have established market prices.

3) Nonmarket emphasis (Alternatives 1 and 4) — emphasis on wildlife, roadless areas, wilderness areas, and recreation.

4) 1980 RPA program (Alternative 2) — determine how the RPA program can best be implemented.

5) Maximum Wilderness Alternative (Alternative 4) — emphasize wilderness designation.

6) Wilderness emphasis and commodity outputs (Alternative 5a).

Differing themes of management were then developed which responded in various ways to the issues, concerns, and roadless evaluations principles. Rather than try to combine all nonmarket values in one required alternative, two were designed. One emphasized wildlife and roadless area management (Alternative 1), and the other emphasized wilderness and recreation management (Alternative 4). Another alternative is developed to update existing unit plan direction and to respond to changing needs. Roadless lands with unique features are recommended for wilderness, while other roadless lands are recommended to remain roadless to meet semi-primitive recreation and wildlife habitat needs (Alternative 6). Alternative 9 is a departure from nondeclining timber harvest, and is also analyzed for the set of designations, objectives, and constraints comprising Alternative 6.

The new Proposed Action, Alternative 10, displayed in this Final EIS is a modification of Alternative 6 through incorporation of public comment and concern. Alternative 10 gives greater emphasis to roadless management, has lower timber harvest levels and lower levels of available livestock forage than Alternative 6.

A refinement of the Maximum Present Net Value benchmark is made, insuring spatial fitting and feasible land designations. This was Alternative 3.

Roadless and wilderness designations are analyzed by developing various strategies under three major alternatives that tested the change in management intensity in order to meet the roadless or wilderness area requirements. These alternatives are easily identifiable by the subscript of "a," "b," or "c" following the alternative numbers (Alternatives 5a, 5b, 5c, 6a, 6b, 7a, and 7b). One of these alternatives was designed to designate most roadless area for roadless management or wilderness, while emphasizing market outputs on currently roaded lands (Alternative 5a). This alternative also corresponds to the roadless evaluation principle which requires that most roadless areas be designated to wilderness, and commodity outputs be increased on roaded lands.

Analysis of these comparisons showed that there was an adequate range of designations and resource outputs. The oil production figures, at first inspection, appear to provide a limited range of production levels. This is explained by nearly 95 percent of the Forest's land base being currently leased or producing oil and gas. This limits the opportunities to regulate the flow of the oil and gas from the Forest.

All of these alternatives were tested against the benchmark capacities in order to determine if a wide range had been provided to respond to major issues. Figure II-1 displays the range of alternatives as they response to the major Forest issues. This figure provides the reader with a visual comparison of the relationships among the alternatives. The line graph represents the range of outputs covered by the alternatives. The output level for each alternative is indicated below the line graph.

c. Constraints Used to Develop Alternatives

The FORPLAN model is used in developing each alternative. The objectives to be achieved by each alternative are modeled by placing constraints within the FORPLAN model. While each alternative carries somewhat of a unique theme, a few constraints are used consistently to represent the Forest situation or legal obligations. These common constraints are more fully discussed in Appendix B, Section VII-B and are only briefly described here.

Mitigation measures are incorporated into all of the management prescriptions, as are management standards, guidelines, and minimum management requirements. These are also discussed in Appendix B, Sections III-D and VI-B.

The Absaroka-Beartooth Wilderness is considered to remain as wilderness throughout all alternatives. Proposed wilderness areas have an option to be designated for wilderness or nonwilderness, depending upon the alternative.

Oil production is predicted to occur across the entire Forest, except for areas with low potential (Sheyenne Ranger District, Pryor Mountains, and Lost Water Canyon on the Beartooth Ranger District). There are limited FORPLAN constraints on oil production, because all existing leases are considered legally binding.

Lower limits of livestock AUM's for each Ranger District are established to insure a reasonable distribution across the Forest. It is considered to be infeasible to consider transferring permitted cattle among Ranger Districts that are hundreds of miles apart.

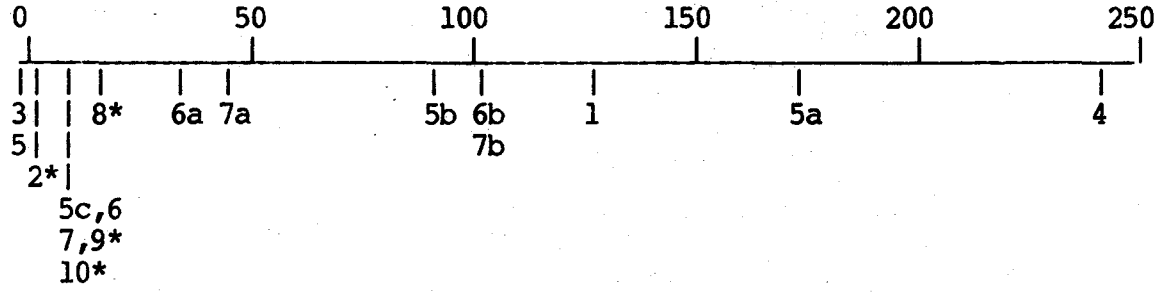
A lower threshold of timber harvest by Ranger District is established to insure a sufficient supply for maintenance of a timber market within reasonable distance of the timber stands. For management and silvicultural purposes, a nondeclining yield and ending inventory constraint are identified for every alternative except Alternative 9 (Departure).

An objective function of maximum present net value is always used in the FORPLAN model to insure a cost-efficient solution, given the specific set of constaints for each alternative.

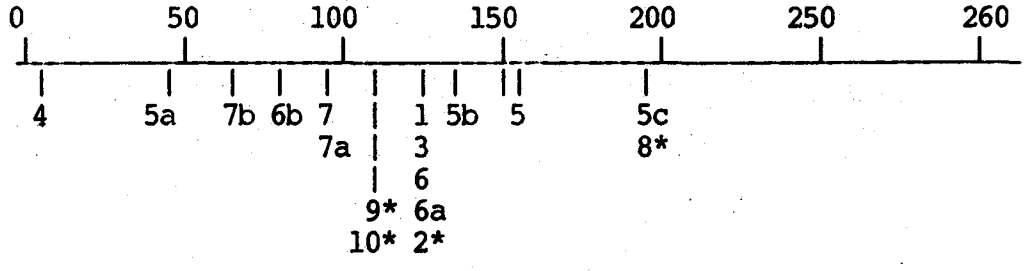
FIGURE II-1

RANGE OF ALTERNATIVE'S RESPONSIVENESS TO THE MAJOR ISSUES

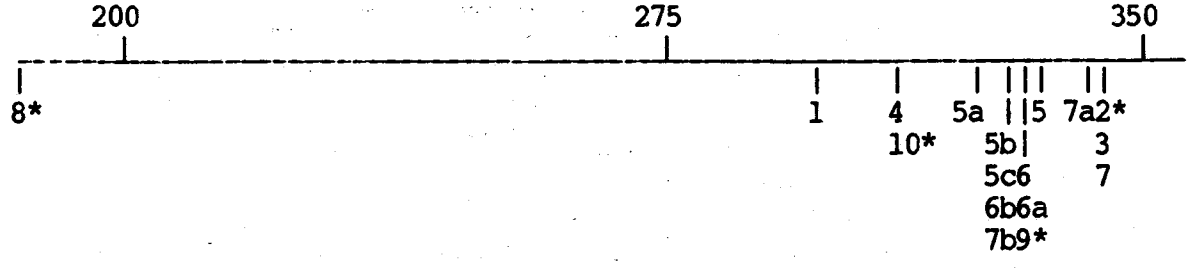
New Wilderness Recommendation
(thousand acres)



Roadless Area Designation
(thousand acres)

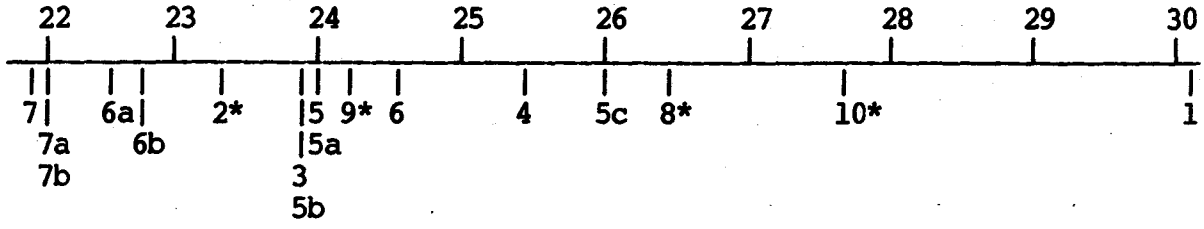


Cumulative Oil Production
(millions barrels of oil)

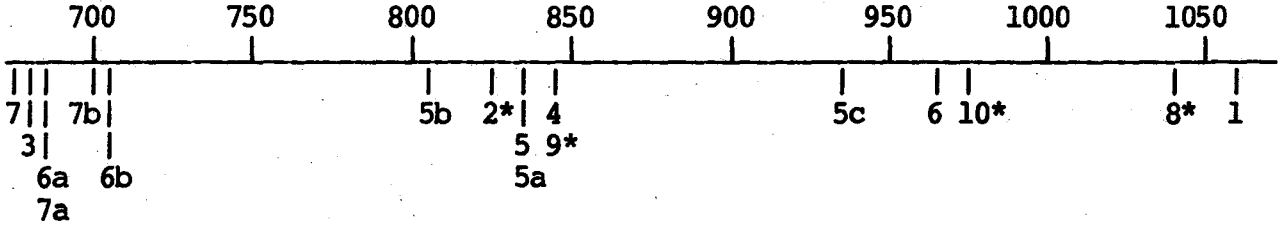


* Alt. 2 is RPA
Alt. 8 is Current Management
Alt. 9 is a Departure
Alt.10 is the Proposed Action

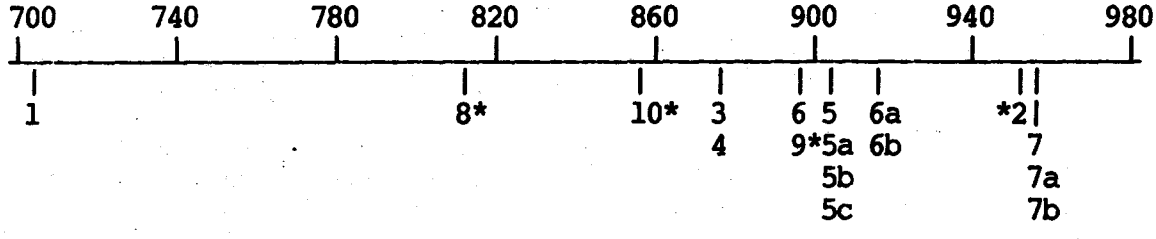
Provided Capacity for Deer
(thousands of deer—decade 1)



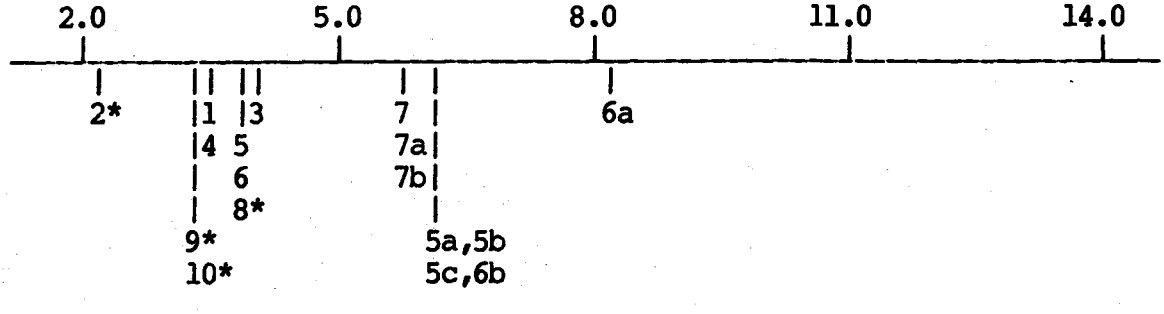
Provided Capacity for Elk
(number of elk—decade 1)



Livestock Grazing
(thousands of AUM's in decade 3)



Timber Volume
(million board feet in decade 1)



* Alt. 2 is RPA
Alt. 8 is Current Management
Alt. 9 is a Departure
Alt.10 is the Proposed Action

C. Description of Alternatives

Summary of Changes Between the Draft EIS and Final EIS

Alternative 10 has been added. This alternative was developed from Alternative 6, the preferred alternative in the Draft EIS. Alternative 10 is the Preferred Alternative in this Final EIS.

Other changes in this section are the output values for each alternative for the various outputs. These values were in error in the Draft EIS but were corrected in an accompanying errata table. Tables and graphs have been revised to reflect the fact that projected outputs/activities for decade one are expected outputs/activities and those beyond the first decade are only projections of the long-term implications of the plan. While long-range effects, outputs/activities have been estimated, the plan is only valid until it is revised, committing the Forest to a course of action no longer than 15 years.

No change was made in the intent, purpose or management emphasis of any of the alternatives presented in the Draft EIS.

In this section are the descriptions and discussions for each of the 17 alternatives considered. Each alternative has a defined objective, development process, response to the planning issues and major management concerns, and an economic discussion.

In accordance with the planning regulations and NEPA, public issues and management concerns are vital in the development and assessment of each alternative.

The five planning issues for the Custer National Forest are as follow:

1. At what level of use and management intensity should livestock be managed on the Forest, considering public needs and demands for all resources?
2. In response to National demands for energy and strategic minerals, how can the Forest provide for mineral exploration and development while also providing resources?
3. How and where will the resource base, including riparian (stream-bank) zones and woody draws, be managed and protected for wildlife in view of competition from other resources?
4. What are the long-term public and resource management access needs and how should they be resolved?
5. What is the long-range need for low development areas and how should they be managed?

The management concerns for the Custer National Forest are:

1. Certain timber volumes from the forested Districts are needed to ensure a reasonable flow to the industry and for the enhancement of range forage and wildlife habitat.
2. Recreation opportunity needs to be evaluated across the Forest. Many rural areas depend almost entirely upon Forest Service facilities and National Forest System lands for public use. Conversely, recreation facilities and public lands near the metropolitan areas are also an integral part of the total public recreation opportunity.
3. The scenic beauty of the lands under the Custer National Forest's management is an important management concern. Existing Visual Condition is used to monitor the upper limits of the negative disturbance to the landscape. It is the goal of any management theme to maintain the natural character and beauty of the land as a response to public expectations and administrative policy.
4. The assessment of the total Public Net Benefit is vital to the selection of the Proposed Action. This value includes all returns to society from the Forest less all costs, including priced and nonpriced goods and services, employment and social programs.
5. The required budgets for each alternative in comparison to realistic expectations of Congressional actions are probably most critical to the success of the Proposed Action.

1. Alternative 1

The objective of this alternative is to analyze the effects of emphasizing wildlife management and maintaining a high level of roadless areas. In this alternative, valuable wildlife habitat and roadless areas would be of prime consideration. As many acres as possible from the inventoried roadless areas would be designated to roadless management. Other resource outputs and responses would be left unconstrained. Commodity values would not be emphasized, but produced in response to these other resource needs.

a. Response to the planning issue of grazing levels:

Alternative 1 responds to this issue by reducing livestock grazing from approximately 875,000 AUM's to 728,000 AUM's by the fifth decade. A high proportion of the forage that would be produced would be made available for wildlife needs as well as for aiding in the protection and management of watershed values.

Livestock management would for the most part be in response to the need to minimize impacts to the wildlife habitat. Complex grazing systems would be implemented to benefit wildlife by increasing forage production, by removing livestock for certain periods of time, or to establish a satisfactory rotation of use across the allotment. Consequently, livestock numbers would be adjusted

downward to lessen impacts on wildlife. Allotments critical to wildlife needs may be closed and some livestock producers may be forced to rely on other sources for livestock forage.

b. Response to the planning issue of energy and strategic mineral exploration and development:

Oil production would be at the one of the lowest level of all the alternatives, approximately 302 million barrels accumulative. Mineral exploration and production activities in the key wildlife habitat and roadless areas would be restricted to no surface occupancy or other special lease stipulations in order to maintain or increase wildlife hiding and feeding areas and to protect the character of the roadless areas. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Current oil and gas leases within roadless areas, and existing or recommended wilderness areas, would not be recommended for reissuance, or would be reissued with a "no surface occupancy" stipulation where necessary to protect the Federal estate. By the end of the first decade, 219,000 acres of the Forest would be visually impacted. This reflects the disturbance caused by the oil and gas development as well as by some of the wildlife habitat manipulation that noticeably impacts the landscape. These acres would decrease to 149,000 by the end of the planning horizon.

About 725,800 acres of National Forest lands on the Custer in the States of Montana and South Dakota would be available for exploration of locatable hardrock minerals.

c. Response to the planning issue of wildlife management in riparian areas and woody draws:

This alternative would provide the optimum opportunity for wildlife management. Approximately 1,262,000 acres would be designated to wildlife emphasis, and within this designation would be about 152,000 acres of woody draws and riparian areas. As a result, the woody draw/ riparian area would be revitalized by eliminating, to the degree possible, the mechanical damage, the soil compaction resulting from browsing by livestock. This would allow more sprouting of woody plants and tender grasses. Other uses including oil development would be restricted. Road building would avoid these areas, unless another route is not possible. This would provide a potential increase in wildlife populations. Management activities in the remaining woody draws and riparian areas, while managed under a variety of strategies, would consistently consider the fragility of such areas. It needs to be recognized that livestock and wildlife would continue to share the use of the woody draws and riparian areas. This alternative would provide the greatest amount of wildlife emphasis to alleviate the livestock impacts to these vital wildlife habitat areas. As a result, the woody draws and riparian areas would continue to provide hiding cover and browse to the dependent wildlife species. The designation of 116,788 acres to roadless status would also protect many of these unique ecosystems.

d. Response to the planning issue of long-term access needs:

This alternative would not create the additional access to the Forest's boundary that the public indicated was a need. Total road miles would increase by 644 during the first decade of this alternative, primarily for timber harvest and oil and gas exploration and development within the Forest. These would be the roads considered to be permanent parts of the transportation system. Many other miles of roads could be built, servicing oil and gas development. Such roads can be considered somewhat temporary, in that at the end of the production period they would be obliterated. These roads are often private and under permit to individual companies. They would not be considered available for public travel. Road management schemes, encompassing closures or travel restrictions whether a part of the total Forest's public transportation system or a part of the private road network, would be implemented to recognize the wildlife emphasis of the alternative. Breeding and nesting seasons, as well as fawning and hatching periods, would be respected in the travel restrictions for roads in or near these areas.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a long-term need for low development areas. Of the 258,280 acres of inventoried roadless areas, approximately 116,800 acres or 45% would be retained. This alternative maintains the ninth largest proportion of existing roadless areas in a low development status. Management of surface resources and, to the extent possible, subsurface resources would be for values such as wildlife habitat, water quality, visual quality, and roadlessness. However, the Federal mineral rights under portions of these areas are currently leased and some limited development could occur subject to valid existing rights.

Of the 258,280 acres of inventoried roadless, 129,000 acres are recommended for wilderness classification. The Absaroka-Beartooth Wilderness remains as classified wilderness, as in all other alternatives.

f. Response to the management concern of recreation opportunity needs across the Forest:

The developed recreation facilities such as campgrounds, picnic grounds, and interpretive sites, would be maintained as long as the use does not interfere with important wildlife habitat. If conflicts do arise, recreation use in the developed sites would be restricted. No new facilities would be constructed, but maintenance funds would be adequate to keep the facilities from deteriorating. The length of season for most of the areas receiving moderate to high use would be three months.

A wide variety of dispersed recreation opportunities would be available, such as big game, upland bird, and waterfowl hunting, cold and warm water fishing, hiking, nature study and driving for pleasure. The driving for pleasure opportunity would decrease somewhat under this alternative because use would be restricted on roads that involve significant wildlife habitat areas. Wildlife-related recreation visitor days that include the hunting, fishing, and nature study activities would increase from approximately 164,000 to slightly over 500,000 by the fifth decade. This large increase would reflect the theme of the alternative and the public users' response to the wildlife management emphasis.

g. Response to the management concern of timber harvest levels:

A moderate level of timber harvest (3.5 MMBF) would be scheduled annually during the first decade because of the forage, browse and hiding cover that harvested openings can provide for deer. This activity would impact slightly over 3,300 acres of the National Forest Districts during these 10 years. The amount of timber harvested then would be maintained at approximately this level through the fifth decade. Of the 157,000 tentatively suitable acres, 83,000 were selected for timber management in this alternative.

h. Response to the management concern of public net benefit:

During the first decade, yearly average budget expenditures of $7,100,000 would produce outputs and activities that would provide $43,200,000 of receipts to the U.S. Treasury and $10,800,000 to the various State treasuries. This alternative would also provide 6,117 jobs to the private sector. The Present Net Value of this alternative would be $3,812,000,000.

2. Alternative 2 (RPA)

The objective of this alternative is to meet the direction in the "Revised President's Statement of Policy", which states that "at least one alternative in the DEIS will be developed to determine how the 1980 Forest and Rangeland Renewable Resources Planning Act (RPA) program could best be implemented on the Forest." The Forest's projected RPA program outputs, activities, and costs are assigned through the Northern Region Guide in response to National demand. As such, this alternative explores the production compatibility among resources using RPA targets in timber, minerals, range, and recreation.

a. Response to the planning issue of grazing levels:

The level of domestic livestock grazing would increase from the existing level of 875,000 to 973,000 by the fifth decade in response to this issue. Forage production would be maximized to the extent possible through complex grazing management systems and range improvement practices. This alternative would require a substantial increase in the range program budget to achieve the desired levels of forage production. The animal unit months (AUM) assignment from RPA cannot be met after the year 2020 because it exceeds the land's capability.

Livestock numbers would be increased on most allotments, as would the costs to livestock producers to implement the complex grazing systems needed. The additional private investments could adversely affect some ranching operations.

b. Response to the planning issue of energy and strategic mineral exploration and development:

Oil production would be at a high level, approximately 345 million cumulative barrels, ranking the second highest of all the alternatives. All areas, except the Absaroka-Beartooth Wilderness and Lost Water Canyon, would be available for oil and gas leasing. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. There would be no particular restrictions on the issuance of new leases, other than the standard environmental needs. The increase in oil and gas activities would contribute to a decrease in favorable grouse habitat and the existing visual condition of the land decreases. By the end of the first decade about 272,000 acres (more than double 1980 disturbed acreage of 122,000) would have been visually impacted. This would reflect the disturbance caused by the oil and gas development as well as by the range improvement practices that detract from the natural landscape. The impacted area would be reduced to 201,000 acres by the end of the planning horizon as the landscape impacts begin to heal.

About 845,500 acres of National Forest System lands in Montana and South Dakota would be available for exploration of locatable minerals.

c. Response to the planning issue of wildlife management in riparian areas and woody draws:

Slightly over 125,000 acres would be designated to wildlife emphasis in response to the habitat improvement projections in RPA. Because of the

emphasis of meeting the RPA assignments and other resource needs, particularly the range program, wildlife management would be emphasized on those areas that would not be important to these other resources. Of the 125,000 acres in wildlife management, 1,100 would be in the woody draw/riparian area ecosytems. The condition and vitality of these ecosystems not managed for wildlife habitat would not significantly improve and maintenance would be difficult. There would be very little potential for wildlife population increases. Resource development activities and livestock impacts would continue to create soil compaction, mechanical damage (including removal of woody species and tender grasses), and livestock browsing of forage.

d. Response to the planning issue of long-term access needs:

Access to and within the Forest would increase in this alternative because of the emphasis to meet the RPA production assignments, particularly timber. Roading would increase about 1,880 miles in the first decade. Suitable timber land would be roaded by the fifth decade and oil development roads would be in place during the first decade. Many other miles of roads would be built that would serve particularly the oil and gas development. These roads would not generally be used for public travel and would be under permit to the individual companies. These roads could be considered somewhat temporary, in that, by the end of the production period, they would be obliterated.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a long-term need for low development areas. Of the 258,280 acres of inventoried roadless areas, approximately 128,600 acres or 50% would be retained, the fourth largest proportion of all the alternatives. These acres would be maintained through the management of surface resources and to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. However, Federal mineral rights under portions of these areas are currently leased and some limited oil and gas development could occur subject to valid existing rights.

Two small additions, totally approximately 300 acres, would be made to the Absaroka-Beartooth Wilderness.

f. Response to the management concern of recreation opportunity needs across the Forest:

The developed recreation facilities such as campgrounds and picnic grounds would receive maintenance to prevent deterioration. A regular season of use, about 3 months, would be provided. One new facility, a canoe landing on the Sheyenne Ranger District, would be constructed. Use of the developed facilities is expected to increase.

RPA projections for dispersed recreation including wildlife-related activities would be attained without any major construction. Use is projected to increase from a current 155,000 RVD's to 349,000 RVD's in the fifth decade. The opportunity for other recreation activities, such as driving for pleasure, would increase under this alternative as more roads were constructed.

g. Response to the management concern of timber harvest levels:

The RPA assignment for timber harvest is low in the first decade and the projections could be met. Timber harvest would start at 2.2 MMBF and reach 8.8 MMBF by the fifth decade. Of the 157,000 tentatively suitable acres for timber management, 102,000 acres would be so managed in this alternative. By the end of the first decade, about 443 acres would have been harvested. Long-term sustained yield is 12.8 MMBF.

h. Response to the management concern of public net benefit:

During the first decade, yearly average budget expenditure of $6,800,000 would produce outputs and activities, providing $49,900,000 in receipts to the U.S. Treasury and $12,500,000 to the States' treasuries. There would be 7,155 private sector jobs made available. The Present Net Value of this alternative would be $4,000,000,000.

3. Alternative 3

The objective of this alternative is to determine the level of goods and services that result from maximizing the Present Net Value. To ensure feasibility and reasonable distribution of activities and outputs across the Forest, certain levels of the timber and range outputs were specified. These were the only constraints. By using the maximum PNV objective function in the FORPLAN model, the results of the analysis showed the best way to achieve this alternative.

a. Response to the planning issue of grazing levels:

Grazing level would increase to 898,000 AUM's by the fifth decade. During the first decade, there would be a slight decrease in response to the oil and gas development. Grazing levels would be very close to existing levels and would be expected to meet local demand for livestock forage for the planning horizon. This would tend to indicate that current AUM production would be at or near optimal cost efficiency. The level of grazing would not be expected to impact the functioning of the livestock producers' ranching operations, unless large increases were requested. If such requests were made, they could not be fulfilled in this alternative. There would be very little new investment required for the range management in this alternative.

b. Response to the planning issue of energy and strategic mineral exploration and development:

This alternative would produce the highest level of oil along with Alternative 2, reaching 345 million barrels of oil. All lands would be considered available for leasing. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Lost Water Canyon, considered to have low oil potential, would not be recommended for leasing, should the opportunity arise. By the end of the first decade, 277,000 acres will have been visually impacted. This acreage would reflect the disturbance caused by the oil and gas development and would decrease through time to a low of 206,000 acres by the end of the planning horizon.

All of the National Forest System lands on the National Forest Districts would be available for exploration of locatable minerals, other than the Absaroka-Beartooth Wilderness. New leases and subsequent lease issuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS.

c. Response to the planning issue of wildlife management in riparian areas and woody draws:

Over 373,000 acres would be designated to wildlife management in this alternative. Of this acreage, 8,730 acres would be in the woody draws and riparian areas. These woody draws and riparian areas would be protected and managed by restricting road building, oil and range developments, and livestock utilization. This would tend to protect or revitalize existing vegetation, which in turn would enhance the wildlife use. The potential for population growth would increase on these acres. The remaining acres of these ecosystems would have a variety of management themes, a few of which would not emphasize wildlife, but would include mitigating impacts to the habitat. This alternative would recognize the importance of the woody draws and riparian areas in the remaining areas.

d. Response to the planning issue of long-term access needs:

The programs in this alternative would require about 1,880 miles of additional roads, primarily for oil and gas development and timber harvest. These roads would be considered a part of the permanent transportation network for the Forest and would provide some additional access to the Forest boundary. The location of these new roads would depend upon the discovery of oil reserves or the timber stands identified for harvest. Most suitable timber land would be accessed within 30 years. The opportunity for motorized access to and within the Forest would be enhanced. This may or may not meet the access needs for the recreating public. The opportunity for motorized access would be reduced by the designation of about 120,400 acres to roadless management. Many other miles of roads would be built that would serve oil development and not be used or retained for public travel. These could be considered temporary, in that they would be obliterated at the end of the production period. There would be little restriction upon traffic on the roads identified for the transportation network.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a long-term need for low development areas. Of the 258,280 acres of inventoried roadless areas, approximately 120,400 acres or 45% would be retained, maintaining the seventh largest proportion of all alternatives. Management of these lands would protect the surface resources such as wildlife habitat, water quality, visual quality, and roadlessness. The Federal mineral rights under portions of these areas are currently eased and some limitd development could occur subject to valid existing rights.

There would be no additions to the wilderness system. The Absaroka-Beartooth Wilderness would remain as wilderness.

f. Response to the management concern of recreation opportunity needs across the Forest:

The developed recreation sites on the Beartooth Ranger District would be well maintained to attract more use and all would remain open for the regular season, about 3 months. A few new sites would be constructed on the Ashland Ranger District. Because recreation use adds significantly to the PNV, use would be encouraged.

Dispersed recreation activities such as hunting (deer, upland birds, and waterfowl) would also increase as wildlife management was emphasized on over 373,000 acres. Driving for pleasure, another dispersed recreation activity, would also increase, particularly in regard to the increased miles of roads needed for resource development. Wildlife-related recreation visitor days would increase from the current 155,000 to slightly over 410,000 during the fifth decade.

g. Response to the management concern of timber harvest levels:

The harvest level would begin at 4.4 MMBF and reach 6.0 MMBF by the fifth decade. This harvest would impact about 10,470 acres during the first decade. Of the 157,000 tentatively suitable acres, 122,000 would be designated to timber management. The long-term sustained yield would be 10.6 MMBF.

h. Response to the management concern of public net benefit:

During the first decade, yearly average budget expenditure of $7.1MM would produce outputs and activities that would return $50.0MM to the U.S. Treasury and $12.5MM to the States' treasuries. There would also be 7,223 jobs available in the private sector. The Present Net Value of this alternative is $4,120,000,000.

4. Alternative 4

The objective of this alternative is to emphasize the wilderness and recreation resources. All inventoried roadless areas would be recommended for wilderness classification. Because few recreation visitor days are derived from wilderness use (less concentration of people than in other dispersed activities), recreation visitor days would be adjusted downward so that wilderness recommendations could be met. The other outputs would be left unconstrained. Production of commodity goods would continue, but only in response to these noncommodity outputs.

a. Response to the planning issue of grazing levels:

Grazing would occur at a fairly even level, 898,000 AUM's, dropping slightly in response to oil production during the first decade and early in the second. The existing proportion of forage available to livestock and to wildlife would stay about the same as now exists. There would be very few if any complex grazing systems used in this alternative, occurring only on the 7,256 acres managed for range emphasis. There would not be any expected impact to the livestock producers using the Forest's rangeland. This is expected to meet the local demand for grazing during the planning period.

b. Response to the planning issue of energy and strategic minerals exploration and development:

Wilderness designations preclude oil development and the production levels would be very low, 315 million cumulative barrels, second only to the lowest production in Alternative 1. This alternative would show an apparent incompatibility of wilderness classification and oil production. Current leases across the Forest that fall in the recommended wilderness areas would not be reissued. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. By the end of the first decade, about 249,000 acres would be visually impacted, primarily by the oil and gas development. This condition would improve through time to 184,000 acres within 75 years. About 708,000 acres of the National Forest System lands of the Custer National Forest in Montana and South Dakota would be available for exploration for locatable minerals.

c. Response to the planning issue of wildlife management in the riparian areas and woody draws:

Over 327,000 acres would be designated to wildlife management emphasis. Of this acreage, about 6,600 acres would be woody draws or riparian areas. These areas would have restrictions upon activities that tend to degrade them for wildlife use, avoiding impacts such as soil compaction, mechanical damage, and livestock browsing. Road building, oil and range developments, and livestock utilization would not generally occur in these areas. Such management would increase the potential capacity for wildlife on these areas. Many of the remaining acres of woody draws and riparian areas would fall in a wilderness classification. This would protect these areas from some uses, but not particularly enhance the wildlife values. Livestock grazing would continue across the Forest even in the wilderness areas, continuing the competition for these desirable areas. The areas that are not in a wilderness designation would tend to be protected also, but not enhanced, through multiple-use coordination.

d. Response to the planning issue of long-term access needs:

Road mileage would increase 648 miles across the Forest. This would not enhance the opportunity for greater access to or within the Forest. These roads would be needed to develop the resources identified in the alternative and would be considered part of the permanent transportation network for the Forest. There would be little, if any, restrictions on the traffic using this permanent transportation system, unless roads were built through areas designated for wildlife emphasis. Other private roads would be built to support the oil and gas development, but would not be used for or retained for public travel. Because all of the inventoried roadless areas would be recommended for wilderness classification (which allows no road building) in this alternative, the opportunity for motorized access in these areas would be eliminated.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a long-term need for low development areas. Of the 258,280 acres of inventoried roadless areas, approximately 16,600 acres or 6% would be retained, the smallest proportion of existing roadless areas of all the alternatives. This one area, Tonge River Breaks, would be managed for surface resource protection of values such as wildlife habitat, water quality, visual quality, and roadlessness. The Federal mineral rights under portions of this area

are currently leased and some development could occur, subject to valid existing rights.

All of the remaining roadless areas would be recommended for wilderness classification. This alternative is highly responsive to the issue of additional wilderness. The Absaroka-Beartooth Wilderness, of course, would remain as wilderness.

f. Response to the management concern of recreation opportunity needs across the Forest:

The developed recreation facilities, such as campgrounds and picnic grounds, would be maintained so that deterioration would not occur and to encourage use, consistent with the objective of the alternative. A three month season would be available for most sites. One new facility would be built, a canoe landing on the Sheyenne River on the Sheyenne Ranger District. Use at these facilties would be expected to increase through time.

Dispersed recreation, including wildlife-related activities, would increase at a moderate level and would reflect the designation of over 327,000 acres to wildlife emphasis. Wildlife-related recreation visitor days would increase from the current 155,000 to approximately 408,000 by the fifth decade. Other nonmotorized activities such as hiking, viewing scenery, backpacking and camping, would grow in proportion to motorized activities because of the designation of all of the inventoried roadless areas to wilderness. Driving for pleasure would also increase because of the additional roads being built for resource development, but not to the same extent as in other alternatives that have less wilderness designation.

g. Response to the management concern of timber harvest levels:

The timber harvest level in this alternative would be 3.4 MMBF in the first decade, increasing to 7.6MMBF during the second decade. This level would decrease through time until the end of the planning horizon. To harvest this amount of timber, about 6,120 acres would be harvested the first decade and about 18,280 acres during the fifth decade. Of the 157,000 tentatively suitable acres for timber management, 74,310 would be selected for treatment in this alternative. Timber harvest does not significantly contribute to the objectives of this alternative.

h. Response to the management concern of public net benefit:

The first decade of this alternative would require an annual budget of $7,100,000 which would produce the outputs and activities that would provide $46,700,000 of receipts to the Federal Treasury and $11,675,000 to the States' treasuries. There would be 6,702 jobs in the private sector. The Present Net Value of this alternative would be $3,798,000,000.

5. Alternative 5

The objective of this alternative is to continue the current level of outputs provided by existing unit plans, multiple-use plans, and long-range Forest goals and objectives. Unit plans exist for all Districts of the Custer National Forest except the Grand River Ranger District which has a multiple-use plan. To formulate this alternative, current resource outputs were levels to be achieved. The budget to achieve these outputs was not constrained. The 10-year timber program was defined and certain areas to be retained as roadless were identified.

a. Response to the planning issue of grazing levels:

The grazing would stay at the current level, of about 875,000 AUM's a year, with a slight decrease for a period of about 10 years because of oil development. Grazing would increase to approximately 920,000 by the fifth decade. The existing proportion of forage available to wildlife and livestock would remain at present levels. Range management would be emphasized on slightly over 7,200 acres, requiring complex grazing systems and private investments into range improvements. The unit plan direction would be continued on over 754,000 acres which would require a mixture of grazing systems and improvements. Livestock management would remain much as it is today.

b. Response to the planning issue of energy and strategic mineral exploration and development:

Oil production would be at a moderate level, producing about 334 million barrels. Oil and gas development would be expected to continue to impact the wildlife habitat and range productivity. These impacts would tend to diminish through time as oil fields were developed and activities reduced. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Surface occupancy cut-off dates for oil and gas activities would be enforced in roadless areas. Oil and gas developments would change the existing visual condition. By the end of the first decade, over 270,000 acres would be visually impacted, mostly in response to the oil development. The visual condition of these acres would improve through time and, by the end of the planning horizon, the impacted acres would be reduced to 213,000 acres.

All of the land on the National Forest Ranger Districts, except the Absaroka-Beartooth Wilderness, would be available for exploration of locatable minerals.

c. Response to the planning issue of wildlife management in the riparian areas and woody draws:

This alternative would provide a moderately low opportunity to manage wildlife habitat. About 163,000 acres would be designated to wildlife emphasis, and of this acreage, 6,500 acres would be woody draws and riparian areas. Activities and uses causing mechanical damage, soil compaction, and livestock browsing of forage would be restricted in these areas, though not necessarily eliminated. This would protect and revitalize the vegetation in these areas to enhance the wildlife use. This acreage would not be considered great enough to precipitate any noticeable change in wildlife population. The remaining acres of these ecosystems fall into a variety of designations. However, 34,800 acres would remain in the existing management strategy which respects the fragility and importance of the areas. Wildlife habitat would be protected to the extent possible in light of the attractiveness of these ecosystems for livestock use and the continued level of grazing.

d. Response to the planning issue of long-term access needs:

Roading would increase across the Forest by 1,295 miles. These miles of road would be the permanent transportation network for the Forest. Some consideration would be given to the recreational access needs to the Forest boundary; however, given the level of oil produced in this alternative (334 million barrels), many other roads would be built to aid in extracting this resoruce. These roads would not be permanent and in most cases would be planned for obliteration at the end of the production period. They are not included in the above figure. The timber volumes planned for harvest under the existing program would necessitate part of this increased permanent roading. Suitable timber lands would nearly all be accessed by the third decade. Some travel restrictions would occur on roads that traverse areas (163,000 acres) that are identified for wildlife management.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a long-term need for roadless areas by designating 157,500 acres for roadless management. The areas known as Essentially Roadless Areas in North Dakota would be retained, although there are significant oil and gas development in some of them. They would be kept in this designation because the Unit Plans for the area call for them to remain.

There would be no recommended wilderness areas in this alternative.

Of importance in this alternative is a clarification of the Tongue River Breaks situation. It was previously recommended for wilderness in the 1979 RARE II Final Environmental Impact Statement and the Ashland Unit Plan concurred with the recommendation. According to the Unit Plan, if Congress did not ultimately classify the area as wilderness, its management would revert to roadless as a riding and hiking area. In the meantime, the 1979 RARE II EIS was found to be lacking in specificity (by an Appeal Court) and all Forests were directed to complete site-specific analysis for wilderness recommendations. Before the Forest analysis could be completed, the Lee Metcalf Wilderness and Management Act of 1983 (P.L. 98-140) established that Tongue River Breaks need not be managed for the purposes of protecting its suitability for wilderness designation during preparation of this initial Forest Plan, thus removing it from mandatory wilderness consideration. In keeping with the objective of this alternative, the area would be designated to roadless management.

f. Response to the management concern of recreation opportunity needs across the Forest:

Developed recreation facilities such as campgrounds and picnic grounds would be maintained to prevent deterioration. Most sites would be available for use for 3 months in the summer, the regular season. A new facility, a canoe landing, would be built on the Sheyenne River on the Sheyenne Ranger District. A few new fishing sites would also be built on the Ashland Ranger District as identified in the unit plan and would be responsive to the population increase in the area. Use at developed sites across the Forest would not necessarily be encouraged, rather increase in use would be a function of population increases.

Dispersed recreation activities would increase at a moderate level, including driving for pleasure which would increase as the roading increased across the Forest. Activities that are wildlife-related such as hunting and fishing would moderately increase, generally due to the limited acres designated to wildlife management. The recreation visitor days for these activities would increase from the current 155,000 to 381,000 by the fifth decade.

g. Response to the management concern of timber harvest levels:

In response to the existing 10-year timber plan, the harvest for the first decade is 4.1 MMBF and would increase to 7.0 MMBF and remain at that level for the planning horizon. This level of harvest would impact 10,000 acres in the first decade. Of the 157,000 tentatively suitable acres, 94,300 would be designated to timber management. The long-term sustained yield is 8.2 MMBF in this alternative.

h. Response to the management concern of public net benefit:

During the first decade, yearly average budget

expenditure of $7,050,000 would produce outputs and activities that provide $48,600,000 in receipts to the U.S. Treasury and $12,150,000 to States' treasuries. This alternative would provide for 6,962 private sector jobs and has a Present Net Value of $4,001,000,000.

6. Alternative 5a

The objective of this alternative is to analyze the effects of increased designations of wilderness and/or roadless and at the same time increase the level of outputs such as timber, livestock grazing, and oil production. The development of this alternative was the same as Alternative 5, except that approximately an additional 182,000 acres of roadless areas (in addition to the 339,841 acres in the Absaroka-Beartooth Wilderness) were designated to wilderness. Additionally, the outputs of timber and livestock grazing were not constrained to levels identified in the current unit plans and multiple use plans covering the Forest. As a result, intensive management practices and resource coordination becomes necessary to provide an increased level of these outputs.

a. Response to the planning issue of grazing levels:

The grazing would stay at the current level, about 875,000 AUM's a year, with a slight decrease in regard to oil development, but increase to about 919,000 by the fifth decade. The existing proportion of available forage for livestock and wildlife would remain. Range management would be emphasized on about 10,900 acres which would require some investment into complex grazing systems to maintain the required amount of AUM's. Unit Plan direction would continue on slightly less that 647,000 acres (a reduction from Alternative 5). This would mean that livestock management would remain much like it is today but grazing would increase somewhat over time. The additional wilderness would not appear to restrict the available forage for livestock grazing, but requires more intensive range management on other areas.

b. Response to the planning issue of energy and strategic mineral exploration and development:

Oil production would be slightly reduced from Alternative 5 by about 9 million barrels, producing 326 million barrels. This would rank as the fourth least producing alternative. The oil development would create visual impacts by changing the landscape on 253,000 acres by the first decade. By the end of the planning horizon, these acres would be reduced to 184,000 acres. This is a marked reduction from Alternative 5. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. About 756,800 acres of the National Forest System land of the Custer National Forest in Montana and South Dakota would be available for locatable mineral exploration.

c. Response to the planning issue of wildlife management in riparian areas and woody draws:

Wildlife management would be emphasized on about 115,000 acres in this alternative. This is 47,000 acres less than in Alternative 5. Of the total acreage, 855 are in woody draws or riparian acres. While activities and uses which are detrimental to the vitality of these areas would be restricted in these areas, the acreage is not large enough to create a perceivable change in wildlife population. While vegetative and structural manipulation would not generally be feasible in wilderness, the reduced traffic and other management activities would tend to favor wildlife values in this area. Management would have to be intensified outside the wilderness to meet the required output constraints and this would respect the fragility of these areas to the extent possible.

d. Response to the planning issue of long-term access needs:

Arterial and collector roads would increase 1,492 miles, 197 more miles than needed in Alternative 5. This would represent the need of intensifying management on the areas not in a wilderness classification in order to meet the required outputs levels. The opportunity for motorized access throughout the Forest is slightly increased in this alternative. The areas that were designated to wilderness were previously roadless; therefore, no reduction in existing access occurs. The timber harvest would necessitate this roading and access will be largely built within 30 years. The oil and gas development program would also require these roads, as well as many other roads that would not be a part of the permanent transportation network and most likely would be obliterated when they are no longer needed by the private user. There would probably be some travel restriction on permanent roads that traverse the 115,000 acres of wildlife emphasis lands, in order to respect the needs of many of the wildlife activities.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a greater long-term need for wilderness than roadless areas. Of the 258,280 acres of inventoried roadless resource, approximately 45,900 acres or 17% would be retained, the second smallest proportion of all of the alternative. The surface, and to the extent possible subsurface, resources would be managed to protect resource values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal minerals rights under portions of these areas are currently leased and some

development could occur, subject to valid existing rights.

The wilderness designation would be recommended for 182,000 acres, or 70 percent of the total inventoried roadless resource. This major portion of the roadless inventory would represent a recognition of the wilderness values. The Absaroka-Beartooth Wilderness would, of course, remain as classified wilderness.

f. Response to the management concern of recreation opportunity needs across the Forest:

The recreation setting for developed recreation would be the same as for Alternative 5 in that facilities would be maintained to prevent deterioration. Most sites would be available for use for 3 months in the summer, the regular season. The additional wilderness areas would not eliminate any developed recreation sites. A few new sites would be built on the Ashland Ranger District as identified in the unit plan and would be responsive to the population increase in the area. A new canoe landing would be built on the Sheyenne Ranger District. Use at all developed sites across the Forest would be expected to increase.

The nonmotorized component of the dispersed recreation activities would increase in the newly designated wilderness areas. This would include activities such as hiking, backpacking, camping, and nature study. Other dispersed activities that are wildlife-related would increase moderately, although there are considerably less acres managed for wildlife emphasis as compared to Alternative 5. These recreation visitor days would increase from the current 155,000 to 276,000 by the fifth decade.

g. Response to the management concern of timber harvest levels:

The harvest level of this alternative would be 6.7 MMBF in the first 10 years, increasing slightly to 6.8 MMBF for the remainder of the planning horizon. This would impact 15,000 acres in the first decade. Of the 157,000 suitable acres, 82,930 would be management for timber.

h. Response to the management concern of public net benefit:

The average budget for the first 10 years would be $7,600,000 and would produce the outputs and activities that would return $48,400,000 to the Federal Treasury and $12,100,000 to the States' treasuries. There would be 6,913 jobs in the private sector and the Present Net Value of this alternative would be $3,910,000,000.

7. Alternative 5b

The objective of this alternative is to analyze the effects of an increased designations of roadlessness while maintaining a high level of wilderness and other outputs such as timber, livestock grazing, and oil production. This alternative would provide 125,900 acres of roadlessness, almost triple that of Alternative 5a, but the amount of wilderness would be decreased to 93,500, about half of that provided in Alternative 5a. Additionally, the outputs of timber and livestock grazing were not constrained to levels identified in the current unit plans and multiple use plans covering the Forest. As a result, intensive management practices and resource coordination becomes necessary to provide an increased level of these outputs.

a. Response to the planning issue of grazing levels:

The level of grazing would remain at or near current levels (875,000 AUM's a year) and increase over time to 919,000 AUM's by the fifth decade. The existing proportion of forage available to wildlife and livestock would remain the same. Range management, however, would be emphasized on few acres due to the level of grazing currently occurring in those areas that would be designated to roadless or wilderness. Livestock management would remain much as it is today.

b. Response to the planning issue of energy and strategic minerals exploration and development:

Oil production would be further reduced in this alternative from Alternative 5, making it the fifth lowest, and would produce 330 million barrels of oil. The restrictions on oil production by wilderness and roadless classification would be responsible for the drop in production. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Leasing in the recommended wilderness areas would not be allowed. Leasing in the roadless areas would either be not recommended or recommended with stringent surface occupancy stipulations if it was necessary to protect the Federal estate. By the end of the first decade, over 265,000 acres would be visually impacted primarily by the oil development. These acres would improve through time and by the end of the planning horizon, the visual impacts would cover 195,000 acres. This would be a slightly lower level of impacts as compared to Alternative 5.

About 810,300 acres of National Forest System lands of the Custer National Forest in Montana and South Dakota would be available for exploration of locatable minerals.

c. Response to the planning issue of wildlife management in ripaian areas and woody draws:

This alternative would offer less opportunity to manage wildlife habitat than Alternative 5. Slightly over 146,000 acres would be designated to wildlife emphasis and of these acres, 785 are in woody draws. The amount of acreage would not

play a significant role in affecting wildlife populations, although detrimental activities and uses would be restricted in these unique ecosystems. The remaining acres of woody draws and riparian areas would be under differing management strategies, including 40,000 acres following unit plan direction and about 88,000 acres to a minerals emphasis. Management would be intensified on the remaining acres to achieve the other resource outputs in range and timber. This intensification would tend to impact habitat. The woody draws and riparian areas would be protected, not particularly enhanced, in the roadless/wilderness areas, and would likely be affected by the management activities outside these areas. The potential for increased wildlife populations would not be enhanced in this alternative.

d. Response to the planning issue of long-term access needs:

The roading across the Forest would increase by 1,470 miles during the entire planning horizon (175 miles more than Alternative 5), reflective of the greater management intensity of this alternative over Alternative 5. These roads would be the permanent transportation network for the Forest and would serve the timber program and the oil and gas development. The suitable timber land would nearly all be accessed by the third decade. Many other roads would be required by the oil and gas development and would not be retained for public transportation. Motorized access would be eliminated in the recommended wilderness areas and the opportunity for additional roading would be limited in the areas retained in roadless management. There would likely be some restriction on the traffic that interfered with the areas designated for wildlife emphasis, as in Alternative 5, but to a lesser degree.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a long-term need for low development areas. Of the 258,280 acres of inventoried roadless resource, approximately 125,900 acres or 49% would be retained, the fifth largest proportion of all the alternatives. These acres would be maintained through the management of surface and, to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these areas are currently leased and some development could occur, subject to valid existing rights.

Of the remaining roadless acres, 93,513 acres would be recommended for wilderness classification, of which 9,800 is in Lost Water Canyon of the Pryors Mountains. The remaining acreage, 83,713, would be added to the Absaroka-Beartooth wilderness, increasing its size to 423,554 acres. Between the roadless designations and the wilderness recommendations, 84% of the roadless resource would be in protective status.

f. Response to the management concern of recreation opportunity needs across the Forest:

Developed recreation management would be very similar to Alternative 5, other than the sites on the Ashland Ranger District would not be built. The canoe landing would be built on the Sheyenne Ranger District.

Dispersed recreation activities would increase at a moderate level, the same as Alternative 5. There would be a greater proportion of driving for pleasure to take advantage of the additional roading. Wildlife-related recreation activities would respond the same as in Alternative 5, and use would increase from the current 155,000 RVD's to 376,000 by the fifth decade.

g. Response to the management concern of timber harvest levels:

The harvest level in this alternative would be 6.7 MMBF in the first decade. This would impact about 15,000 acres during this period of time. Of the 157,000 suitable acres, 99,810 would be designated to timber management in this alternative. The long term sustained yield would be 8.7 MMBF, slightly more than Alternative 5.

h. Response to the management concern of public net benefit:

The average budget for the first 10 years would be $7,700,000 that would return $48,200,000 to the Federal Treasury ($400,000 less than Alternative 5) and $12,050,000 to the States' treasuries ($100,000 less than Alternative 5). This would provide 6,857 jobs in the private sector and the Present Net Value of this alternative would be $3,940,000,000, about $61,000,000 less than Alternative 5.

8. Alternative 5c

The objective of this alternative is to analyze the effects of an increased designations of roadlessness while maintaining a high level of wilderness and other outputs such as timber, livestock grazing, and oil production. This alternative would provide 184,400 acres of roadlessness, but only 11,000 acres of additional wilderness. Additionally, the outputs of timber and livestock grazing were not constrained to levels identified in the current unit plans and multiple use plans covering the Forest. As a result, intensive management practices and resource coordination becomes necessary to provide an increased level of these outputs.

a. Response to the planning issue of grazing levels:

The level of grazing would remain at or near current levels (875,000 AUM's a year) and increase over time to 919,000 AUM's by the fifth decade. The existing proportion of forage available to

wildlife and livestock would remain the same. Range management, however, would be emphasized on few acres due to the level of grazing currently occurring in those areas that would be designated to roadless or wilderness. Livestock management would remain much as it is today.

b. Response to the planning issue of energy and strategic minerals exploration and development:

Oil production would be slightly less than Alternative 5, but more than Alternative 5a and 5b, producing 331 million barrels. This would be about the fifth highest producing alternative. The fewer wilderness acres, in comparison to Alternatives 5a and 5b, would allow greater development. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Leasing in the recommended wildernesses would not be allowed, and those leases in the areas in roadless management would either be not recommended for issue or reissued wih surface occupancy restrictions, if it were necessary to protect the Federal mineral estate. The impacts to the landscape would reach 265,000 acres by the end of the first decade. This would represent primarily the oil and gas development. These would improve to 208,000 acres by the end of the planning horizon.

There would be 843,839 acres of the National Forest System lands on the Custer National Forest in Montana and South Dakota available for exploration of locatable minerals.

c. Response to the planning issue of wildlife management in riparian areas and woody draws:

This alternative would be very similar to Alternative 5 in the opportunity to manage wildlife habitat. About 160,900 acres would be designated to wildlife emphasis and of this, 3,880 are in the woody draws and riparian areas. This would be slightly more than half of the designation of these unique areas occurring in alternative 5. These acres would not significantly create an increase in wildlife populations, although soil compaction, mechanical damage, and livestock browsing would be limited, improving the condition of these areas. The remaining acres of these ecosystems would be managed under a variety of strategies, the most prevalent being minerals emphasis on over 126,000 acres and the continuation of unit plan direction on 35,000 acres. The vitality of the woody draws and riparian areas would not necessarily improve under this management. However, the importance and fragility of these ecosystems would be recognized and mitigation measures taken to the extent possible. The oil production, timber harvest, and range management would be intensified on the remaining acres, and these areas would be impacted.

d. Response to the planning issue of long-term access needs:

The arterial and collector roads would increase by 1,482 miles over the entire planning horizon (75 years). These roads would be the permanent transportation network for the Forest and are more than what is needed in Alternative 5, but very nearly the same as Alternative 5a and 5b. These roads would be needed to achieve the timber harvest and oil production identified in this alternative. Suitable timber land would be nearly all accessed by the third decade. Given the level of oil that would be produced, many other roads would be built that would not be a permanent part of the public routes and would not be retained for future use. Motorized access to the recommended wilderness areas would be eliminated. The opportunity for roaded access to the roadless areas would also be forgone. Some travel restrictions would occur on the routes that traverse areas designated as wildlife emphasis.

e. Response to the planning issue of low development, road.ess, and wilderness areas:

This alternative would recognize a long-term need for both low development areas and wilderness. Of the 258,280 acres of inventoried roadless resource, approximately 184,500 acres or 71% would be retained as roadless, maintaining the largest proportion of all alternatives. These acres would be maintained through the management of surface and, to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these areas are currently leased and some development could occur, subject to valid existing rights.

In addition to the Absaroka-Beartooth Wilderness, 11,000 acres would be designated to wilderness.

f. Response to the management concern of recreation opportunity needs across the Forest:

Developed recreation facilities would be maintained to prevent deterioration. Most sites would be available for the regular season of 3 months. A canoe launch on the Sheyenne Ranger District would be the only new constructed facility. Use would be expected to increase at all sites. This would be the same as Alternative 5b.

Dispersed recreation activites would increase at a moderate level, similarly to Alternative 5, although the driving for pleasure component would increase in proportion to other activities because of the greater roading. The wildlife related activities would increase similarly to Alternative 5 and 5b. Recreation use would increase from the current 155,000 to 381,000 RVD's by the fifth decade. This would be reflective of the amount of land being managed for wildlife emphasis.

g. Response to the management concern of timber harvest levels:

In response to the 10-year timber plan for the forest, 6.7 MMBF of timber would be harvested for the first decade. This would impact around 15,000 acres during this period. Of the 157,000 suitable acres, 104,290 would be designated to timber management. The long-term sustained yield would be 9.0 MMBF.

h. Response to the management concern of public net benefit:

The first decade, yearly average budget expenditure of $7,4000,000 would produce outputs and services that would return $48,100,000 and $12,025,000 to the States' treasuries. There would be 6,907 jobs in the private sector and the Present Net Value of this alternative would be $3,959,000,000.

9. Alternative 6

This alternative was the Preferred Alternative in the Draft EIS. It is presented again in the Final EIS for comparison purposes, especially against Alternative 10 which is a modification of Alternative 6 based on public comment. Alternative 10 is the new Preferred Alternative. The objective of this alternative is to respond to a variety of resource needs and the issues and management concerns facing the Forest. New management strategies were developed in response to changing needs. This alternative has very site specific constraints that would meet the need of each particular Ranger District. These were translated into outputs requirements or prescription constraints.

a. Response to the planning issue of grazing levels:

Grazing continues near current levels, beginning slightly higher and dropping to current levels during the first decade and into the next, as a response to the oil and gas development impacts. The grazing level would reach 913,000 AUM's by the end of the fifth decade. Range management would be emphasized on slightly over 23,600 acres and new complex grazing systems could be implemented in these areas. Allotment management would remain much like today, recognizing some growth in grazing levels through the years. The proportion of forage available to wildlife would increase in this alternative. The grazing systems would be responsive to these needs. Livestock producers would be expected to respond to the increased investments needed in this alternative.

b. Response to the planning issue of energy and strategic minerals exploration and development:

Oil production is at the sixth highest level, producing 337 million barrels. Oil and gas development would continue to impact the wildlife habitat and range productivity in order to produce this level of oil. These impacts would improve through time and in response to the management strategies selected in this alternative. Preplanning oil development would occur on over 835,000 acres and this would tend to mitigate the environmental impacts to an acceptable degree. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Leasing in recommended wilderness areas would not be allowed, and leases in the roadless areas would either not be made or would be issued with stringent surface occupancy stipulations, if it were necessary to protect the Federal mineral estate. Impacts to the landscape would reach 268,000 acres by the end of the first decade, improving through time and rehabilitation to about 196,000 acres by the end of the planning horizon.

Approximately 832,000 acres of National Forest System land of the Custer National Forest in Montana and South Dakota would be available for exploration of locatable minerals.

c. Response to the planning issue of wildlife management in ripaian areas and woody draws:

This alternative would provide a fairly high opportunity to manage wildlife habitat with about 268,500 acres designated to wildlife emphasis. Of this acreage, 18,600 acres would be woody draws and riparian areas. This would ensure the enhancement of these areas for wildlife habitat, in light of the attractiveness of these areas for livestock. Activities related to oil development, road building, and livestock grazing would be restricted in these areas, though not necessarily eliminated. Sprouting of browse and grass species would increase as soil compaction, mechanical damage and livestock browsing is reduced, and the general vitality and benefit of these areas for wildlife habitat would improve. The remaining acres of woody draws and riparian areas would be managed under a variety of other strategies, including over 20,000 acres to continue unit plan direction and nearly 835,000 acres to minerals emphasis that includes preplanning of oil development areas, taking into account the importance and fragility of these areas.

d. Response to the planning issue of long-term access needs:

Roading would increase by 1,857 miles over the next 75 years to produce the identified level of timber and oil for this alternative. These would be a part of the permanent transportation system. Suitable timber lands would be nearly all accessed by the third decade. Given the level of oil production, 334 million barrels, many other roads would be built that would provide the access for this resource development. Unlike the permanent roads, these roads would not be for

public use nor would they be retained for a permanent transportation system. The areas that would be recommended for wilderness would not have any roading, and the opportunity for new motorized access in the areas managed for roadless would be foregone.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a long-term need for low development areas. Of the 258,280 acres of inventoried roadless resource, approximately 125,500 acres or 49% would be retained in a low developed status, maintaining the eleventh largest proportion of all alternatives. These acres would be maintained through the management of surface, and to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these areas are currently leased and some development could occur, subject to valid existing rights.

The wilderness setting would be somewhat more complex in this alternative than others. The Absaroka-Beartooth Wilderness, of course, would remain in wilderness, although there would be some inclusions and exclusions that would be specific to refining the management of the area. Burnt Mountain area (about 4,200 acres), Mystic Lake (about 500 acres), Timberline Creek (about 950 acres), and an area near the Wyoming State line (approximately 500 acres) would be additions to the Wilderness. This would create a net gain to the Absaroka-Beartooth Wilderness of approximately 6,000 acres.

Lost Water Canyon (Montana) would be a separate area recommended for wilderness.

f. Response to the management concern of recreation opportunity needs across the Forest:

Developed recreation facilities such as campgrounds and picnic grounds would be maintained to prevent deterioration and to enhance the setting, particularly on the Beartooth Ranger District. There would be a few new sites constructed on the Ashland Ranger District to respond to the growing population in that area. No other sites would be built. Use would be expected to increase at all sites, though overuse is not expected.

Dispersed recreation activities would increase, particularly in regard to driving for pleasure, using the additional roads throughout the Forest and the wildlife-related activities (hunting, fishing, and nature study). The wildlife related recreation visitor days would increase from the current 155,000 to 387,500 by the fifth decade.

g. Response to the management concern of timber harvest levels:

Timber would be harvested at the level of 4.0 MMBF in the first decade. This would remain at 4.0 MMBF in the following years. The first decade harvest would impact 12,100 acres. Of the 157,000 tentatively suitable acres, 77,400 would be managed for timber. The long-term sustained yield for this alternative would be 6.7 MMBF.

h. Response to the management concern of public net benefit:

The first decade yearly average budget expenditure of $7,100,000 would provide outputs and services that would return $49,300,000 to the Federal Treasury and $12,300,000 to the States' treasuries. This would provide 6,944 jobs in the private sectors. The Present Net Value of this alternative would be $4,037,000,000.

10. Alternative 6a

The objective of this alternative is to analyze the effects of increasing the wilderness and roadless designations on the Preferred Alternative (Alternative 6) in the Draft EIS while attempting to increase the outputs of timber, livestock grazing, and mineral production.

a. Response to the planning issue of grazing levels:

Livestock grazing would remain approximately at the same level as in Alternative 6 during the first decade but would increase slightly over time. By the end of the planning horizon the level of livestock grazing would be 934,000 AUM's. In order to achieve this level of grazing many more acres would be put into range emphasis. This alternative would designate 88,200 acres to this emphasis, as compared to about 20,000 acres in Alternative 6. This indicates that more complex grazing systems would be necessary to compensate for the areas designated for roadless and wilderness. Livestock producers would be expected to contribute to the investments needed to produce this level of grazing.

b. Response to the planning issue of energy and strategic mineral exploration and development:

Oil production in this alternative would be 336 million barrels. This would be a decrease from Alternative 6 of 2 million barrels, reflective of the reduced number of acres available for production due to the wilderness classification and the termination of and the lack of lease issuance. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Leasing in the recommended wilderness areas would not be allowed. Leases in roadless areas would be either not recommended for issuance or issued with stringent surface occupancy stipulations, if it were necessary to protect the Federal mineral estate. Impact to the landscape would be relatively high regardless of the areas being recommended for wilderness. By the end of the first

decade, about 265,000 acres would be visually impacted and by the end of the planning horizon, this acreage would improve to nearly 207,000 acres. These acres primarily represent the results of oil and gas development. Rehabilitation and lessening of activity though time would aid in reducing these impacted areas.

There would be 836,000 acres of National Forest System lands of the Custer National Forest in Montana and South Dakota available for locatable mineral exploration.

c. Response to the planning issue of wildlife management in the riparian areas and woody draws:

This alternative would provide less opportunity for wildlfie management than Alternative 6. Slightly over 178,000 acres would be designated to wildlife emphasis, and of those acres, 11,100 acres would be woody draws and riparian areas. This acreage would have some effect on creating an increase in wildlife popluations by protecting or revitalizing the condition of the woody draws and riparian areas. Impacts such as soil compaction, mechanical damage, and livestock damage would be mitigated or eliminated to the extent possible on these 11,100 acres. A continuation of current direction would occur on another 22,044 acres of these unique ecosytems and 117,500 acres would be managed for a minerals emphasis, utilizing preplanning of the oil fields. Both strategies recognize the importance and fragility of these areas and impacts would be avoided whenever possible.

d. Response to the planning issue of long-term access needs:

The roading network would increase by 1,861 miles over the 75 year planning horizon. This is nearly the same a Alternative 6. These roads would be considered the permanent transportation network for the Forest. Suitable timber land would be nearly all accessed by the third decade. The other roads that would be built for oil production and, unless identified as part of the permanent network, would not be retained for public use and would be obliterated at the end of the production period. The opportunity for motorized access in the 118,451 acres of roadless and the 36,560 acres of wilderness would be eliminated, although little is available there currently. It would be likely that some travel restriction would be applied to the routes that traverse the areas with wildlife management emphasis. These would be in respect to nesting, fawning, and breeding seasons of various species.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a long-term need for low development areas. Of the 258,280 acres of inventoried roadless resource, approximately 120,100 acres or 46% would be retained. These acres would be maintained through the management of surface and, to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these areas are currently leased and some development could occur, subject to valid existing rights.

Wilderness additions would amount to 36,560 acres or 14 percent of the available roadless acres. The Absaroka-Beartooth Wilderness would remain a classified wilderness.

f. Response to the management concern of recreation opportunity needs across the Forest:

Recreation sites, particularly on the Beartooth Ranger District, would be managed to enhance the recreation opportunity. New sites would be built on the Sheyenne and Ashland Ranger Districts. This would differ from Alternative 6, where sites would only be built on the Ashland Ranger District. Use would be expected to increase, but not to the point of overuse.

Dispersed recreation activities would increase, but the activity of driving for pleasure would not increase to the same extent as in other alternatives because the additional roading is less in this alternative. The increase in wildlife-related recreation visitor days is moderate, though slightly less than Alternative 6, going from the current 155,000 RVD's to 377,000 by the fifth decade. This would be a result of the wildlife management emphasis.

g. Response to the management concern of timber harvest levels:

Harvest levels would reach an average 8.4 MMBF during the first 10 years and throughout the entire planning horizon. The first decade program would impact 16,700 acres. Of the suitable 157,000 suitable acres, this alternative would manage 128,000 acres for timber. This level of harvest would be in response to the current 10-year timber program. The long-term sustained yield would be 11.0 MMBF.

h. Response to the management concern of public net benefit:

An average annual budget of $7,700,000 would produce the outputs and services that would return $48,900,000 to the Federal Treasury and $12,225,000 to the States' treasuries. There would be 6,981 jobs in the private sector and the Present Net Value of this alternative would be $4,009,000,000.

11. Alternative 6b

The objective of this alternative is to analyze the effects of increasing the wilderness and roadless designations on the Preferred Alternative (Alternative 6) in the Draft EIS while attempting to

increase the outputs of timber, livestock grazing, and mineral production.

a. Response to the planning issue of grazing levels:

Grazing levels would begin about the same level as Alternatives 6 and 6a, but would increase faster reaching 934,000 AUM's by the fifth decade. This alternative would manage over 90,000 acres for range emphasis with less designation of forage to wildlife than in previous alternatives. Unit plan direction would continue on about 657,000 acres. Livestock producers would be likely to increase their investments to take advantage of the greater forage available.

b. Response to the planning issue of energy and strategic mineral exploration and development:

Oil production would be less than Alternatives 6 and 6a, producing approximately 332 million barrels of oil. The addition of 105,820 acres of wilderness and about 55,000 acres to roadless would, for the most part, create this reduction. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Leasing in the areas recommended for wilderness would not be allowed and leases in the roadless areas would either be not issued or issued with stringent surface occupancy stipulations, if necessary to protect the Federal mineral estate. The impacts to the landscape would reach slightly less than 263,000 acres by the end of the first decade. This would be lower than either Alternative 6 or 6a. These acres would improve to 194,000 by the end of the planning period.

There would be 766,519 acres available for locatable minerals on National Forest System lands of the Custer National Forest in Montana and South Dakota.

c. Response to the planning issue of wildlife management in the riparian areas and woody draws:

This alternative would provide less opportunity to manage wildlife than either Alternative 6 or 6a. About 179,000 acres would be designated to wildlife emphasis, and of this acreage 10,800 acres would fall in the woody draws and riparian areas. While the total acres would differ somewhat, the acres of woody draws and riparian areas would be very similar to Alternative 6a. The condition and vitality of these areas would be enhanced and protected by reducing or eliminating detrimental impacts such as soil compaction, livestock browsing, and mechanical damage. This would have some effect on the potential increase in wildlife population, though not great. The remaining acres of these ecosystems would be managed under a number of other strategies, including about 17,000 to continuation of unit plan direction and 117,000 to minerals emphasis which would utilize preplanning in the oil development areas. The importance of these areas would be recognized, but not necessarily enhanced.

d. Response to the planning issue of long-term access needs:

The roading would increase by 1,825 miles, very similar to Alternatives 6 and 6a, over the 75 year planning horizon. This roading would be needed to produce the level of oil and timber harvest identified for this alternative. These roads would be considered the permanent transporation network for the Forest. Suitable timber lands would be nearly all accessed by the third decade, although some construction does take place in the following 20 years. There would be many other miles of roads built for the private use of the oil developers and would not be retained for public use. The opportunity for motorized access would be eliminated in the additional wilderness and roadless areas, although little now occurs.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a moderate long-term need for low development areas. Of the 258,280 acres of inventoried roadless resource, approximately 81,600 acres or 32% would be retained. These acres would be maintained through the management of surface and, to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these areas are currently leased and some development could occur, subject to valid existing rights.

Wilderness additions of 105,820 (41 percent) acres, plus the Absaroka-Beartooth Wilderness, would create a total of 445,661 acres of classified wilderness.

f. Response to the management concern of recreation opportunity needs across the Forest:

Developed recreation facilities would be maintained to prevent deterioration. Most sites would be available the regular use season (3 months). A canoe launch on the Sheyenne Ranger District would be the only new site built. Use would be expected to increase on all sites, although over use in not expected.

Dispersed use would increase much the same as in Alternative 6 and 6a, although the wildlife related visitor days would not increase to the same level at the end of the fifth decade as these other two alternatives. This use would go from the current 155,000 to 372,000 in this period of time. This would be reflective of the fewer acres being managed for wildlife emphasis.

g. Response to the management concern of timber harvest levels:

This alternative would harvest 6.7 MMBF during the first 10 years, greater than Alternative 6, but less than Alternative 6a. This harvest level would impact about 13,800 acres over the first 10 years. Of the 157,000 acres of suitable timber, 105,250 would be managed for timber emphasis. The long-term sustained yield would be 9.0 MMBF.

h. Response to the management concern of public net benefit:

For the first decade the average annual budget would be $7,300,000 and would produce the goods and services that would return $48,900,000 to the Federal Treasury and $12,200,000 to the States' treasuries. There would be 6,846 jobs in the private sector and the Present Net Value of this alternative would be $3,968,000,000.

12. Alternative 7

The objective of this alternative is to create a high level of market goods and services that would contribute to the National as well as the local economies in the most cost-efficient manner.

This alternative was formulated to optimize the production of timber, livestock grazing, and oil and gas while maintaining the concept of multiple-use management. The constraint levels for these outputs were derived from the benchmarks where each resource achieved an optimal level, although the current 10-year program for timber was used. District levels were established in order to level the production of the outputs across the Forest. The only wilderness allowed was Lost Water Canyon and the Absaroka-Beartooth Wilderness. No roadless constraints were made.

a. Response to the planning issue of grazing levels:

Grazing levels in this alternative would begin higher than the current level, about 906,000 AUM's increasing to 977,000 in 50 years. The proportion of forage available to wildlife would shift to favor livestock, in keeping with the objective of the alternative. Range management would be emphasized on nearly 661,000 acres. This would mean many more complex grazing systems would be needed to produce and utilize the forage, thus requiring greater investments from the livestock producers. Wildlife habitat would not be a primary concern, except in the areas designated as wildlife emphasis areas. Livestock management would definitely intensify in this alternative.

b. Response to the planning issue of energy and strategic mineral exploration and development:

Oil production would be 344 million barrels of oil, one of the highest levels. There would be practically no restrictions on the development, unless there would be potential impacts to another market good. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Surface occupancy could be restricted on the areas managed for roadless. By the end of the first decade, 271,000 acres would be visually impacted.

These acres would improve to 213,000 by the end of the planning horizon. About 836,000 acres of National Forest System lands of the Custer National Forest in Montana and South Dakota would be available for locatable minerals exploration.

c. Response to the planning issue of wildlife management in the riparian areas and woody draws:

About 121,300 acres would be managed for wildlife emphasis in this alternative. Of this acreage, 785 acres occur in woody draws and riparian areas. This would not provide much opportunity to create in increase to wildlife populations, although activities that would cause a detrimental impact to the woody draws and riparian areas would be restricted in these areas. The remaining acres of these ecosystems would be managed under a variety of strategies, although mainly emphasizing market goods. Unit plan direction would be continued on nearly 30,000 acres of the woody draws and riparian areas, and another 127,000 would be managed for range and nearly 5,000 acres would be managed for minerals emphasis using preplanning of the oil development. The result of this designation would be that the woody draws and riparian areas would be considered in all management activities, though not necessarily enhanced nor protected if a market good could be produced on the same acre.

d. Response to the planning issue of long-term access needs:

Roading would increase on the Forest by 1,882 miles over the next in 75 years. This is one of the highest roading scenarios of all of the alternatives. These roads would be considered the permanent transportation network for the Forest. Given the high level of timber and oil production, these roads would sere these resources. Most of the roading of suitable timber land would be accomplished within the first 30 years, although some roading continues into the following 20 years. Many miles of roads would be built to support the oil development that would not be retained for public use. There would be little, if any, restrictions on road use across the Forest.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a fairly low long-

term need for low development areas and wilderness. Of the 258,280 acres of inventoried roadless resource, approximately 93,100 acres or 36% would be retained. These acres would be maintained through the management of surface and, to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these areas are currently leased and some development could occur, subject to valid existing rights.

The only additional area in wilderness would be Lost Water Canyon in Montana. This would create a total of 349,641 acres, including the Absaroka-Beartooth Wilderness.

f. Response to the management concern of recreation opportunity needs across the Forest:

The developed recreation facilities would be maintained and the recreation setting enhanced in this alternative. Most sites would be managed for the regular 3-month season, and others with the potential for use would be kept open until snow season. The canoe launch on the Sheyenne Ranger District would be built and would be the only new construction. Use would be expected to increase.

Dispersed recreation activites would increase, particularly driving for pleasure and other road-related activities in response to the greater miles of road available. Wildlife-related activities, including hunting and fishing, would increase, but to nearly the lowest level of all alternatives. Current use of 155,000 wildlife-related visitor days would increase to 338,800 by the fifth decade.

g. Response to the management concern of timber harvest levels:

This alternative would harvest 6.0 MMBF during the first 10 years, affecting 9,800 acres, increasing to 11.2 MMBF by the fifth decade. Of the 157,000 acres of tentatively suitable timber, 132,500 would be managed for timber. The long-term sustained yield would be 11.4 MMBF in this alternative.

h. Response to the management concern of public net benefit:

The expenditure of an average annual budget of $7,300,000 during the first 10 years would produce goods and services that would return $50,000,000 to the Federal Treasury and $12,500,000 to the States' treasuries. This alternative would provide 7,414 jobs in the private sector and the Present Net Value would be $4,085,000,000.

13. Alternative 7a

The objective of this alternative is to analyze the effects of increasing the wilderness and roadless designations while attempting to maintain a high level of production of the commodity goods and services that would contribute to the National as well as the local economies. To broaden the analysis in respect to wilderness, an increase in wilderness acres was made. Formulation of this alternative was the same as Alternative 7, except that 47,580 acres were specified for wilderness classification in addition to the Absaroka-Beartooth Wilderness. There were no roadless constraints.

a. Response to the planning issue of grazing levels:

Grazing levels would be the same as Alternative 7, increasing to 975,000 in the fifth decade. Range management would be emphasized on 649,000 acres. This would require new complex grazing systems and the related investments. The consequences to the wildlife and livestock producers would be the same as Alternative 7.

b. Response to the planning issue of energy and strategic mineral exploration and development:

Oil production would drop only very slightly in response to more wilderness being allocated in this alternative than in Alternative 7 (dropping only 2 million barrels of oil) to 342 million barrels. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Leasing in the recommended wilderness areas would not be allowed. Leases in the roadless areas would either be not issued or issued with stringent surface occupancy stipulations, if it were necessary to protect the Federal mineral estate. Impacts to the landscape would accumulate to about 266,200 by the end of the first decade, mostly in response to the oil development. These acres would improve through time to 209,000 acres by the end of the planning period.

There would be 809,400 acres of the National Forest Systems lands on the Custer National Forest in Montana and South Dakota available for exploration of locatable minerals.

c. Response to the planning issue of wildlife management in the riparian areas and woody draws:

This alternative would designate slightly over 114,000 acres to wildlife emphasis, similar to Alternative 7. Of this acreage, 785 occur in woody draws and riparian areas. This acreage would not provide much opportunity to create a potential increase in wildlife habitat, although the acres that are designated would be enhanced by reducing or eliminating activities that cause soil compaction, mechanical damage, and livestock browsing. The woody plants and grasses would be given the opportunity to sprout. The remaining acres would be managed either under a continuation of unit plan direction (33,400 acres), minerals

emphasis (9,500 acres), or range emphasis (123,000 acres). As a whole, this alternative would tend to intensify management to maintain the emphasis on market goods. The importance of these areas would be recognized, but not necessarily protected or enhanced, if doing so would be a detriment to the production of market goods.

d. Response to the planning issue of long-term access needs:

Roading would increase in this alternative by 1,836 miles, very close to the amount needed in Alternative 7. Most of the suitable timber lands would be accesssed by the end of 30 years, although some additional roads would be built into the fifth decade. These roads would be the permanent transportation network for the Forest. In order to produce the high level of oil in this alternative, many miles of road would be built to serve the development of the oil fields. These roads would not be retained for public use. This would be like Alternative 7. Motorized access would be very limited in the wilderness areas. On the whole, access throughout the Forest would be increased to meet the timber, oil, and range emphasis.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a low long-term need for low development areas and wilderness. Of the 258,280 acres of inventoried roadless resource, approximately 80,300 acres or 31% would be retained, maintaining the fifth smallest proportion of roadless of all alternatives. These acres would be maintained through the management of surface and, to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these areas are currently leased and some development could occur, subject to valid existing rights.

An additional 47,600 acres, in Montana, would be recommended for wilderness, which would include Lost Water Canyon (9,800 acres). The Absaroka-Beartooth Wilderness remains classified making a total wilderness resource of 387,421 acres.

f. Response to the management concern of recreation opportunity needs across the Forest:

The developed recreation facilities would be maintained to prevent deterioration, and the setting would be enhanced on the Beartooth Ranger District. The only the new site to be constructed on the Forest would be the canoe launch on the Sheyenne Ranger District. Use would be expected to increase on all sites.

The dispersed recreation activities, especially driving for pleasure, would be expected to increase in regard to greater amount of roads available. Wildlife-related recreation visitor days would increase nearly the least of all alternatives, going from 155,000 RVD's currently to 338,900 in the fifth decade. This would be less than Alternative 7.

g. Response to the management concern of timber harvest levels:

This alternative would harvest 6.0 MMBF during the first 10 years, impacting a little more than 6,650 acres. The harvest volume increases to 9.6 MMBF by the fifth decade. Of the 157,000 acres of suitable timber, 116,400 acres would be managed for timber. The long-term sustained yield would be 10.1 MMBF.

h. Response to the management concern of public net benefit:

During the first decade, yearly average budget expenditure of $7,100,000, would provide the outputs and services that would return $49,900,000 to the Federal Treasury and $12,500,000 to the States' treasuries. This would provide 7,367 jobs in the private sector and the Present Net Value would be $4,060,000,000.

14. Alternative 7b

The objective of this alternative is to analyze the effects of increasing the wilderness and roadless designations while attempting to maintain a high level of production of the commodity goods and services that would contribute to the National as well as the local economies. To broaden the analysis in respect to wilderness and roadless an increase these designations was made. Formulation of this alternative was the same as Alternative 7, except than 105,220 acres were designated as wilderness, as well as retaining the Absaroka-Beartooth Wilderness. No roadless constraints were made.

a. Response to the planning issue of grazing levels:

The grazing level in this alternative would be the same as Alternative 7 and 7a. It would begin at a level higher than current and increase faster, reaching 975,000 AUM's by the fifth decade. The impacts to wildlife and livestock producers would be the same as the two previous alternatives.

b. Response to the planning issue of energy and strategic mineral exploration and development:

Oil production would fall below Alternative 7 and 7a due to the greater wilderness designation, producing 331 million barrels. The wilderness designation would sharply curtail oil development. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Leasing in the recommended wilderness would not be allowed. Leases in the roadless

areas would either not be issued or issued with stringent surface occupancy stipulations if necessary to protect the Federal mineral estate. The oil development across the Forest would create visual impacts that would accumulate to about 260,000 acres by the end of the first decade. These acres would improve through time to 191,000 acres by the end of the planning horizon. The impact to the landscape would be lessened considerably from Alternative 7.

This alternative would provide 777,979 acres of National Forest System lands of the Custer National Forest in Montana and South Dakota for exploration for locatable minerals.

c. Response to the planning issue of wildlife management in the riparian areas and woody draws:

This alternative would provide 90,400 acres for wildlife emphasis. Of this designation, 785 acres would fall in woody draws and riparian areas. The results of this designation would be the same as Alternatives 7 and 7a. The remaining acres of these ecosystems would be managed in variety of ways, including continuation of current direction (33,100 acres), range emphasis (121,000 acres), and minerals emphasis (9,000 acres). The impact would be the same as in Alternative 7 and 7a. This would be reflective of this alternative's need to intensify market values production outside the wilderness areas.

d. Response to the planning issue of long-term access needs:

This alternative would increase roading by 1,836 miles, slightly less than Alternatives 7 and 7a. These roads would be built over the next 75 years and would be a part of the permanent transportation network for the Forest. Although the opportunity for motorized access would be precluded in the additional wilderness areas, the remaining areas would become densely roaded to achieve the timber, oil, and range outputs.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a low long-term need for low development areas and a moderate need for additional wilderness. Of the 258,280 acres of inventoried roadless resource, approximately 64,300 acres (25%) would be retained. These acres would be maintained through the management of surface and, to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these areas are currently leased and some development could occur,subject to valid existing rights.

The wilderness designation would gain 105,220 acres, as required in the development of the alternative. The Absaroka-Beartooth would remain classified.

f. Response to the management concern of recreation opportunity needs across the Forest:

Developed recreation facilities would be maintained to prevent deterioration, and the setting would be enhanced on the Beartooth Ranger District. The only new site on the Forest would be the canoe launch on the Sheyenne Ranger District. Use would be expected to increase at all sites.

Dispersed recreation would not increase as quickly as in other alternatives, although driving for pleasure would increase on the new roads across the Forest. Wildlife-related activities would reach one of the lowest levels of all of the alternatives. going from the current 155,000 recreation visitor days to 333,800 by the fifth decade. This would be reflective of the acres managed for wildlife emphasis.

g. Response to the management concern of timber harvest levels:

The timber harvest in this alternative would be very similar to Alternative 7a, beginning at 6.0 MMBF in the first decade. This would impact about 7,900 acres in this decade. Of the 157,000 tentaively suitable acres on the Forest, 106,400 acres would be managed for timber in this alternative. The long-term sustained yield would be 9.1 MMBF.

h. Response to the management concern of public net benefit:

The average annual expenditures for the first decade would be $7,100,000 which would create a return to the Federal Treasury of $48,500,000 and $12,100,000 to the States' treasuries. There would be 7,106 jobs in the private sector and the Present Net Value of this alternative would be $3,946,000,000.

15. Alternative 8 (Current Management)

The objective of this alternative is to continue a level of livestock forage (determined to be the minimally acceptable and representative of actual use over the last 5 years) and a level of timber that represents the average volume cut over the past 10 years. The budget was constrained to an average over the past 3 years with a 5 percent increase through time. The other outputs were left unconstrained to be responsive to the budget. Certain areas were identified for roadless management.

a. Response to the planning issue of grazing levels:

While grazing would occur at a fairly even rate, it would be less than the currently permitted AUM's. Beginning level would be 894,000 AUM's dropping to 800,000 in response to oil and gas development and reaching 833,000 by the fifth decade. The proportion of forage designated to wildlife

would be lessened in the alternative as fewer grazing systems are used to manage the livestock. Range management would be emphasized on slightly over 12,200 acres and would be used to improve rangeland in impacted areas. Livestock would be expected to accumulate in the woody draws and riparian areas, as less complex grazing systems are used. This could possibly not meet local demand through time if livestock producers depend upon the permitted AUM's to increase and improve their operations.

b. Response to the planning issue of energy and strategic minerals exploration and development:

Production of oil and gas would drop off considerably in this alternative, producing 167 million barrels. This would occur mainly in response to the 1.2 million acres managed under minimum level which does not provide the administrative support for a high level of oil production. Wilderness classification of about 18,800 acres also contributes to the reduction. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Leasing in areas recommended for wilderness would not be allowed and leases in the roadless areas (about 132,000 acres) would be either not recommended for issue or issued with surface occupancy stipulations. Existing oil and gas leases have been processed under the guidelines of existing Unit Plans and associated Environmental Impact Statements. This alternative allows that leasing be recommended for nonwilderness areas, and roadless areas without surface occupancy cut-off dates. By the end of the first decade, 146,000 acres would be visually impacted by the oil development. These would improve to 99,600 by the end of the 75 years. About 792,000 acres of National Forest System lands on the Custer National Forest in Montana and South Dakota would be available for exploration of locatable minerals.

c. Response to the planning issue of wildlife management in the riparian areas and woody draws:

About 9,580 acres would be designated to wildlife emphasis in this alternative. None of these acres would fall in woody draws or riparian areas. This would appear to not provide an opportunity to manage these habitats. However, since so many acres fall in the minimum level of management and activities that are detrimental to these areas would be eliminated or severely reduced, the habitats would tend to flourish naturally. By eliminating these factors that detract from the vitality of these areas, sprouting and growth of the woody species and grasses would continue unimpaired. Wildlife habitat would create a potential increase in wildlife populations.

d. Response to the planning issue of long-term access needs:

Arterial and collector roads would increase by 601 miles over the next 75 years. This one of the lowest mileage increases of all of the alternatives. These miles of road would be the permanent transportation network for the Forest. Given the level of oil production in this alternative (167 million barrels), other roads would be built that would provide the access for this resource development. These roads would not be permanent and in most cases would be planned for obliteration at the end of the production period. They are not included in the above figure. The timber volumes planned for harvest under the existing program would necessitate part of this increased permanent roading. Suitable timber lands would nearly all be accessed by the third decade. Some travel restrictions would occur on roads that traverse areas (9,580 acres) that are identified for wildlife management.

e. Response to the planning issue of low development, roadless, wilderness areas:

This alternative would recognize a moderate long-term need for low development areas and new wilderness additions would be limited. Of the 258,280 acres of inventoried roadless resource, approximately 184,800 acres or 72% would be retained. These acres would be maintained through the management of surface and, to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these areas are currently leased and some development could occur, subject to valid existing rights.

Wilderness classification would increase by 18,800 acres (7 percent of the inventoried roadless resource).

f. Response to the management concern of recreation opportunityneeds across the Forest:

The developed recreation facilities would not be maintained to prevent deterioration and the use season would be shortened to reduce potential overuse of the areas. No new sites would be built and use would increase regardless of the administration level. Activities would tend towards dispersed rather than at developed sites.

Dispersed recreation would increase to the lowest level of all of the alternatives, responding to the amount of land in a minimum level of management. Wildlife-related activities would increase at a fairly low level, going from the current 155,000 recreation visitor days to 333,800 in the fifth decade. Although habitat for wildlife populations would increase through time in this

alternative, the facilities, including the campground and roads, would not be available to users. This would be what reduces the amount of wildlife-related recreation in this alternative.

g. Response to the management concern of timber harvest levels:

This alternative would harvest 4.0 MMBF in the first decade, impacting 5,800 acres during this period of time. Harvest volumes would drop to 3.2 over the planning horizon. Of the 157,000 tentative suitable acres, this alternative would manage 31,100 acres for timber.

h. Response to the management concern of public net benefit:

An average annual budget of $4,500,000 for the first 10 years would produce the goods and services that would return $26,800,000 to the Federal Treasury and $6,700,000 to the States' treasuries. There would be 4,622 jobs in the private sector and the Present Net Value of this alternative would be $2,200,000,000.

16. Alternative 9 (Departure)

The objective of this alternative is the same as Alternative 6, to continue the current level of selected outputs and the management direction from the unit plans. New management strategies were developed to respond to changing needs. There were very site specific constraints that would meet the reqirements of each particular Ranger District. The only change in this alternative was that the nondeclining-sustained yield for the timber resource was removed, allowing timber to be harvested on a fluctuating rate in response to other resource needs.

a. Response to the planning issue of grazing levels:

Grazing levels would continue at about the current level with the same trend as the Alternative 6. AUM's would reach 896,000 by the third decade and 914,000 at the end of 50 years. Range management would be emphasized on about 24,500 acres and new complex grazing systems would be implemented in these areas. Allotment management would remain much like it is today, but would recognize a greater designation of forage to wildlife. Livestock producers would be expected to respond to the increased investments needed in this alternative.

b. Response to the planning issue of energy and strategic minerals exploration and developments:

Oil production would be close to Alternative 6, producing 338 million barrels of oil. This level of development would continue to impact wildlife habitat and range productivity. As with the Alternative 6, these impacts would improve through time and in response to the selected management strategies. Preplanning of oil development would occur on over 833,000 acres as in Alternative 6. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Current leases in the recommended wilderness areas would not be reissued and leases in the roadless areas would either be not reissued or reissued with surface occupant stipulations. Impacts to the landscape would reach 269,000 acres by the end of the first decade and by the end of the planning horizon, 75 years, this would improve to 197,000 acres.

Approximately 836,000 aCres of National Forest System land on the Custer National Forest in Montana and South Dakota would be available for exploration of locatable minerals.

c. Response to the planning issue of wildlife management in riparian areas and woody draws:

As in the Alternative 6, this alternative would provide a fairly high opportunity to manage wildlife habitat, with about 267,700 acres designated to wildlife emphasis. Of this acreage, 18,600 acres would be in the woody draws and riparian areas. This would insure the enhancement of these areas for wildlife habitat, in light of the attractiveness of these areas for livestock. Activities related to oil development, road building, and livestock grazing would be restricted in these areas, though not eliminated. Sprouting of browse and grass species would increase as soil compaction, mechanical damage, and livestock browsing is reduced. The remaining acres of the woody draws and riparian areas would be managed under a variety of management strategies, similar to Alternative 6. The fragility and importance of the woody draws and riparian areas would be considered, though not always protected or enhanced in these other management activities.

d. Response to the planning issue of long-term access needs:

The roading would increase by 1,857 miles over the next 75 years. This and the reasons for the development would be the same as in Alternative 6.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a moderately high long-term need for low development areas and wilderness. Of the 258,280 acres of inventoried roadless resource, approximately 109,000 acres or 44% would be retained. These acres would be maintained through the management of surface and, to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these

areas are currently leased and some development could occur, subject to valid existing rights.

The wilderness setting in this alternative would be the same as Alternative 6. The Absaroka-Beartooth Wilderness would receive some additions: Burnt Mountain area would add approximately 4,000 acres, Mystic Lake about 500 acres, Timberline Creek about 950 acres, and an area near the Wyoming State line approximately 500 acres. This would create a total of nearly 6,000 acres. A new recommended wilderness would be Lost Water Canyon, 9800 acres, in Montana.

f. Response to the management concern of recreation opportunity needs across the Forest:

Developed recreation facilities and the dispersed recreation activities would respond the same in this alternative as in the Alternative 6.

g. Response to the management concern of timber harvest levels:

The major difference in this alternative would be the uneven flow of timber through time. Decade production would show 3.1 MMBF in the first decade, but the third decade harvest would be 8.0 MMBF, dropping to 6.5 MMBF in the fifth decade. Thus, the flow would be fluctuating through time without the nondeclining sustained yield requirement. The first decade harvest would impact 3,900 acres. Of the 157,000 tentative suitable acres, this alternative would manage 85,000 acres for timber. The long-term sustained yield would be 7.4.

h. Response to the management concern of public net benefit:

The first decade yearly average budget expenditure of $7,000,000 would provide the outputs and services that would return $49,300,000 to the Federal Treasury and $12,300,000 to the States' treasuries. This would provide 6,943 jobs in the private sector and the Present Net Value of this alternative would be $4,042,000,000, which is not significantly different from Alternative 6 (the Preferred Alternative in the DEIS).

17. Alternative 10 (Preferred Alternative)

The objective of this alternative is to respond to public comments on the Draft EIS. Because Alternative 6, as the previous Preferred Alternative, was a reasonable starting place, this alternative was developed as a modification of Alternative 6. Changes in management direction and outputs are a result of responding to public comment on the Draft EIS and additional analysis. It addresses issues and management concerns facing the Forest. Major revisions occurred in roadless area designation and timber harvest levels. This alternative has very site specific constraints that would meet the need of each particular Ranger District. These were translated into outputs requirements or prescription constraints.

a. Response to the planning issue of grazing levels:

Grazing would continue but at lower than current levels, reflecting more closely the actual permitted livestock numbers in the Forest. By the end of the fifth decade, grazing levels would be returning to 1980 levels. Range management would be emphasized on slightly over 110,900 acres, and new complex grazing systems could be implemented in these areas, targeting range condition improvement. Allotment management would remain much like today, recognizing some adjustment in grazing levels through the years. The proportion of forage available to wildlife would increase through time in this alternative. The grazing systems would be responsive to these needs. Livestock producers would be expected to respond to the investments needed in this alternative.

b. Response to the planning issue of energy and strategic minerals exploration and development:

Oil production is 316 million barrels. Oil and gas development would continue to impact the wildlife habitat and range productivity in order to produce this level of oil. These impacts would improve through time and in response to the management strategies selected in this alternative. Preplanning oil development would occur on over 297,500 acres and this would tend to mitigate the environmental impacts to an acceptable degree. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Leasing recommended wilderness areas would not be allowed, and leases in the roadless areas would either not be issued or would be issued with stringent surface occupancy stipulations. Impacts to the landscape would reach 262,000 acres by the end of the first decade, improving through time and rehabilitation to about 187,000 acres by the end of the planning horizon.

Approximately 832,000 acres of National Forest System land of the Custer National Forest in Montana and South Dakota would be available for exploration of locatable minerals.

c. Response to the planning issue of wildlife management in riparian areas and woody draws:

This alternative would provide a fairly high opportunity to manage wildlife habitat with about 359,000 acres designated to wildlife emphasis. Of this acreage, 18,600 acres would be in woody draws and riparian areas. This would ensure the enhancement of these areas for wildlife habitat, in light of the attractiveness of these areas for livestock. Activities related to oil development, road building, and livestock grazing would be re-

stricted in these areas, though not necessarily eliminated. Sprouting of browse and grass species would increase as soil compaction, mechanical damage and livestock browsing is reduced, and the general vitality and benefit of these areas for wildlife habitat would improve. The remaining acres of woody draws and riparian areas would be managed under a variety of other strategies, including over 20,000 acres to continue unit plan direction and nearly 120,000 acres to minerals emphasis that includes preplanning of oil development areas, taking into account the importance and fragility of these areas.

d. Response to the planning issue of long-term access needs:

Roading would increase by 1,857 miles over the next 75 years to produce the identified level of timber and oil for this alternative. Suitable timber lands would be nearly all accessed by the third decade. Given the level of oil production, 316 million barrels, many other roads would be built that would provide the access for this resource development. These roads would not be for public use nor would they be retained for a permanent transportation system. The areas recommended for wilderness would not have any roading, and the opportunity for new motorized access in the areas managed for roadless would be forgone.

e. Response to the planning issue of low development, roadless, and wilderness areas:

This alternative would recognize a moderately high long-term need for low development areas and wilderness. Of the 258,280 acres of inventoried roadless resource, approximately 114,700 acres or 45% would be retained. These acres would be maintained through the management of surface and, to the extent possible, subsurface resources for values such as wildlife habitat, water quality, visual quality, and roadlessness. Federal mineral rights under portions of these areas are currently leased and some development could occur, subject to valid existing rights.

The wilderness setting would be somewhat more complex in this alternative than others. The Absaroka-Beartooth Wilderness, of course, would remain in wilderness, although there would be some inclusions and exclusions that would be specific to refining the management of the area. Burnt Mountain area (about 4,200 acres), Mystic Lake (about 500 acres), Timberline Creek (about 950 acres), and an area near the Wyoming State line (approximately 500 acres) would be additions to the Wilderness. This would create a net gain to the Absaroka-Beartooth Wilderness of approximately 6,000 acres.

A portion of the Lost Water Canyon (Montana), 5,812 acres, would be a separate area recommended for wilderness.

f. Response to the management concern of recreation opportunity needs across the Forest:

Developed recreation facilities such as campgrounds and picnic grounds would be maintained to prevent deterioration and to enhance the setting, particularly on the Beartooth Ranger District. There would be a new sites constructed on the Ashland Ranger District (fishing sites, trailheads, parking areas) and Sheyenne Ranger District (North Country Scenic Trail, campsites and canoe launches). Use would be expected to increase at all sites, though overuse is not expected.

Dispersed recreation activities would increase, particularly in regard to driving for pleasure, using the additional roads throughout the Forest and the wildlife related activities (hunting, fishing, and nature study). The wildlife related recreation visitor days would increase from the current 155,000 to 419,000 by the fifth decade.

g. Response to the management concern of timber harvest levels:

Timber would be harvested at the level of 3.0 MMBF in the first decade. This would remain at 3.0 MMBF in the following years. The first decade harvest would impact 1,800 acres. Of the 157,000 tentatively suitable acres, 72,360 would be managed for timber. The long-term sustained yield for this alternative would be 6.4 MMBF.

h. Response to the management concern of public net benefit:

The first decade yearly average budget expenditure of $6,680,000 would provide outputs and services that would return $46,500,000 to the Federal Treasury and $11,625,000 to the States' treasuries. This would provide 6,944 jobs in the private sectors. The Present Net Value of this alternative would be $3,806,000,000.

D. Comparison of Alternatives

This section compares the alternatives on a resource by resource basis, providing further definition of the issues and the alternative choices for resolving the issues. The discussion in this section also focuses on how major resource outputs and economic effects vary among alternatives.

Summary of Changes Between the Draft EIS and the Final EIS

There has been a change in the organization of portions of Chapter II to allow for a more complete presentation of the economical and social impacts in the regional area, net public benefit and nonpriced benefits, and priced benefits and present net value (Section D, parts 16-19).

The Major Data Table (Table II-21) at the end of Chapter II has corrected. This table in the Draft

EIS contained numerous errors that were corrected by an errata sheet.

In addition there are changes in some of the individual resource discussions. The Threatened and Endangered Species section has been expanded to include the piping plover and an additional table to clarify grizzly bear habitat ownership within the Greater Yellowstone Grizzly Bear Ecosystem. The discussion on fisheries has been expanded and Figure II-10 has been changed to reflect the change in fish numbers from the current level. The have been major changes in the Minerals and Watershed resource discussions. In the Watershed section Table II-9 was added to show the estimated relative sediment risk among the alternatives. In the Minerals resource section, a discussion was added to help clarify Table II-10.

Resource output changes resulting from changes in assumptions, data corrections, updated information, public input, and further analysis were also made throughout this portion of Chapter II. Most of these changes were in the resource sections covering fisheries, timber, minerals, wilderness/roadless, and threatened and endangered species.

Alternative 10 has been incorporated into the entire discussion which follows. It is considered in each of the resource areas though it may not be specifically mentioned or cited.

Following is the resource by resource comparison of alternatives. This part of Chapter II focuses on the major outputs associated with the alternatives. The table and figures in Section 15 following the resource discussions show how selected resource outputs, representing the public issues, differed among the alternatives. Figure II-17 is a display of percent change from Current Direction for the first decade. Total outputs for each alternative and selected benchmarks are shown in Table II-21.

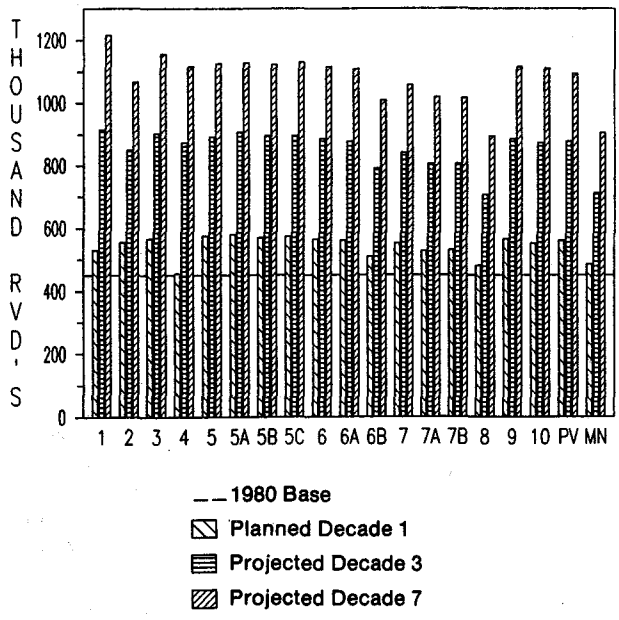
1. Recreation

a. Dispersed Recreation

Dispersed recreation includes a number of activities across the forest, the more popular ones being hunting, fishing, nature study, automobile travel, viewing scenery, hiking, horseback riding and camping. These occur in a roaded natural and semi-primitive motorized and non-motorized setting. Many of the non-motorized activities also occur in the wilderness. All alternatives supply opportunity for dispersed recreation outside wilderness in excess of the expected use. However, as roading develops, particularly in Alternatives 2, 4, 6b, 7, 7a, 7b, 8 and 10, the opportunity for roadless activities lessens. As wildlife management increases in Alternative 1, the wildlife-related recreation increases accordingly. Figure II-2 shows the projection of all dispersed recreation use by alternative.

FIGURE II-2

DISPERSED RECREATION



b. Developed Recreation

The developed sites have an existing capacity of 524,500 recreation visitor days. All alternatives meet total projected use without additional capacity until about 2009, but some sites would be overused due to use patterns. Developed recreation sites mostly occur on the Beartooth Ranger District, having 30 of the 45 sites on the forest. Canoe launch sites will be built on the Sheyenne Ranger District in Alternatives 2, 4, 5, 5a, 5b, 5c, 6a, 6b, 7a, 7b and 10. New fishing sites, trailheads and campsites will be built on the Ashland Ranger District in Alternatives 3, 5, 5a, 5b, 6, 6a, 9 and 10. These sites would add to the forest's capacity and the date of projected use meeting current capacity would be delayed. The construction of the North Country National Scenic Trail on the Sheyenne Ranger District occurs in each alternative. Figure II-3 shows the projection of developed recreation site use for each alternative.

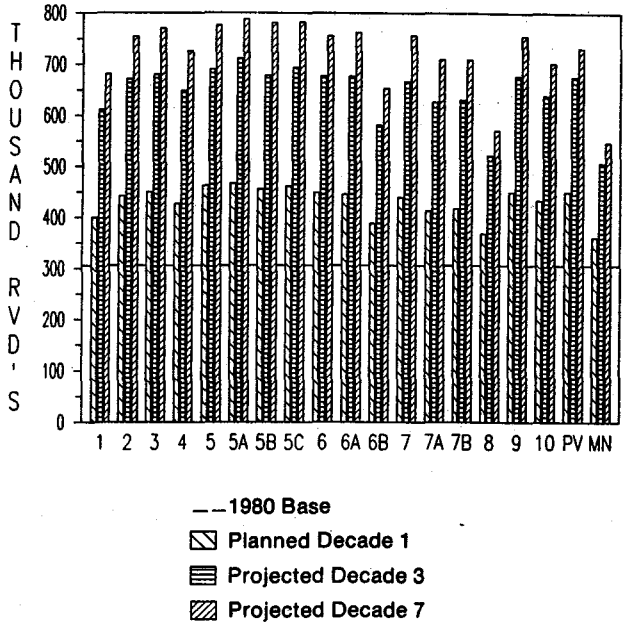
2. Wilderness, Recommended Wilderness, and Roadless Areas

All alternatives retain existing wilderness acres in the Absaroka-Beartooth Wilderness Area, encompassing 339,841 acres. Projected recreation use demand will exceed the existing wilderness capacity by approximately 1996.

National Forest Management Act regulations (revised September 1982 and amended September 1983) require that each Forest inventory

FIGURE II-3

DEVELOPED RECREATION



and analyze management options for roadless lands as a part of the planning process. The Roadless Area inventory for the Custer National Forest was completed in September 1983, and the analysis of management options for these lands has been an integral part of this planning process.

The Custer National Forest inventoried roadless resource (as of September 1983) reported in this EIS includes 22 areas, 12 in Montana and 10 in North Dakota, and comprises 258,280 acres. These lands include all areas that were inventoried in the 1979 RARE II effort except the Horse Creek (L1DAP) and Cheney Creek (L1DAO) Areas in North Dakota. These areas no longer meets the established roadless area criteria (greater than 5,000 acres) because of management activities that have occurred since 1979. In addition, the North Absaroka Area (01371) was expanded to include some additional roadless area identified during the 1983 Roadless Inventory. Lands released by the Lee Metcalf Wilderness Act (Tongue River Breaks 01373) are not being considered for wilderness in this planning process. This area was released from further consideration for wilderness through the Lee Metcalf Wilderness and Management Act of 1983. Therefore, the Tongue River Breaks Area is not included in the wilderness recommendations under any alternative. The area is still included in the inventory of roadless lands and various parts are designated to unroaded management under each of the alternatives. More information on the inventoried roadless areas is located in Chapter III and Appendix C.

Table II-1 displays the 1983 roadless inventory for the Custer Forest and describes the changes in each area since the 1979 RARE II inventory.

Table II-2 shows the Roadless Areas designated to wilderness and the percent of the total roadless acres designated to wilderness under the various alternatives.

The alternatives were formulated to address various aspects of the roadless issue. Alternatives 4, 5a, 5b, 5c, 6a, 6b, 6c, 7a, and 7b specifically address public interest in the wilderness values of particular inventoried roadless areas. With the exception of the Tongue River Breaks Area, Alternative 4 recommends every area for wilderness.

Figure II-4 portrays the amounts of wilderness and unroaded management by alternative. Unroaded or low development management can apply to lands that include the inventoried roadless lands being evaluated for wilderness, the lands released by the Lee Metcalf Wilderness and Management Act (Tongue River Breaks), and unroaded lands that do not meet the roadless inventory criteria such and Horse Creek, Cheney Creek, and Long X Divide areas in North Dakota. Wilderness management applies to lands that are already classified as wilderness (Absaroka-Beartooth Wilderness) or to the inventoried road-

FIGURE II-4

EXISTING/PROPOSED WILDERNESS AND ROADED/ROADLESS DESIGNATION BY ALTERNATIVE

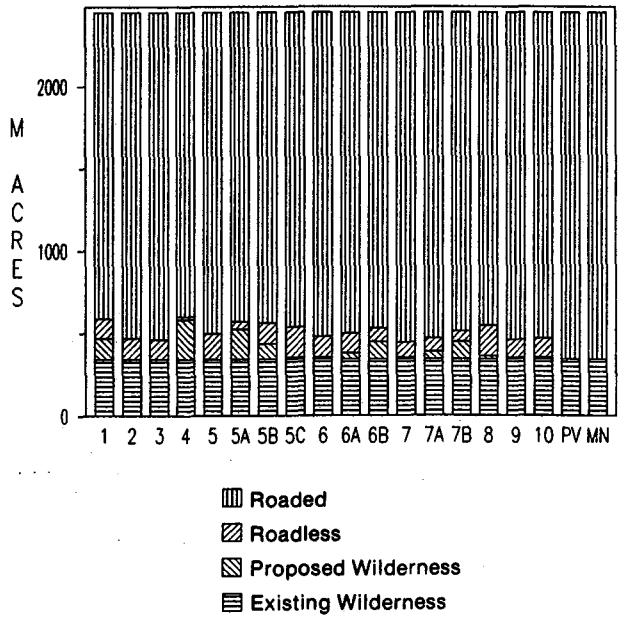


TABLE II-1
ROADLESS AREA INVENTORY CHANGES SINCE RARE II (1979)
CUSTER NATIONAL FOREST

Area Code	Roadless Name	Gross Acres	Net Acres	Change In Gross	Change In Net	Reason	Revised Gross	Revised Net
L1DBD	Ash Coulee (ND)	34620	28560	-20540	-15520	Oil and gas development	14080	13040
01912	Beartooth (MT) Gallatin N.F.	1280 (6320)	1180 (5900)	0	0	—	1280 (5040)	1180 (4720)
L1DAY	Bennett-Cottonwood (ND)	18400	18240	+1840 -4880	+400 -4880	Addition of roadless Oil and gas development	15360	13760
L1DAK	Bell Lake (ND)	11980	10860	+1840 -240	+1840 -240	Addition of roadless Oil development	13580	12460
01368	Black Butte (MT)	0	0	+880	+880	Addition to roadless	880	880
L1DBJ	Bullion Butte (ND)	19130	17760	0	0	—	19130	17760
01364	Burnt Mountain (MT)	—	—	—	—	Originally part of 01363	9320	9320
L1DAO	Cheney Creek (ND)	8180	7460	-8180	-7460	Oil and gas development	0	0
01370	Cook Mountain (MT)	11700	11700	0	0	—	11700	11700
01366	Fishtail Saddleback (MT)	20360	20360	-3800	-3800	Roads and development	16560	16560
L1DAP	Horse Creek (ND)	15020	14380	-10380	-9740	Oil and gas development Addition to area	+3000 7640	+3000 7640
01372	King Mountain (MT)	11900	11700	0	0	—	11900	11700
L1DBI	Kinley Plateau (ND)	21120	19360	0	0	—	21120	19360
01911	Line Crk Plateau (MT) Shoshone NF (WY)	20680 112800	20680 112800	0	0	—	20680 12800	20680 112800
L1DAX	Lone Butte (ND)	13080	12920	+1360 -6760	+820 -6600	Addition of roadless Oil and gas development	7680	7140
01362	Lost Water Canyon (MT)	9800	9800	0	0	—	9800	9800
L1DBB	Magpie (ND)	37240	34960	-31160	-28880	Oil and gas development	6080	6080
01371	North Absaroka (MT) Gallatin National	19440	19240	+5260	+5260	Addition of roadless	22700 170684	22500 159259
01363	Red Lodge Creek-Hellroaring (MT)	28280	28280	-4000	-4000	Incorporated into Absaroka-Beartooth Wilderness (9320 A. reassigned to Burnt Mt. #01364 and 200 A. reassigned to Rock Ck. #01913)	14760	14760
01913	Rock Creek (MT)	—	—	—	—	Originally part of 01363	200	200
L1DBL	Strom Hanson (ND)	18440	15320	+1680 -240	+1680 -240	Addition of roadless Boundary change along river	19880	16760
01373	Tongue River Breaks (MT)	16600	16600	0	0	Released from Wilderness consideration by Senate Bill #96, but may be considered for roadless management	16600	16600
L1DAU	Twin Buttes (ND)	11880	9000	-2880	0	Eliminate private lands	9000	9000
L1DBE	Wannagan (ND)	7480	5880	-1200	-840	Oil and gas development	6280	5040
01369	West of Woodbine (MT)					Originally part of 01371	2000	2000
Totals		357,010	334,240	-78,400	-68,320		278,610	265,920

Inventoried Roadless Area: Montana Acres = 137,880
North Dakota Acres = 128,040

TABLE II-2
WILDERNESS DESIGNATION BY ALTERNATIVE

Area Code	Roadless Name	Total Acres	ALTERNATIVES/BENCHMARKS 1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PNV	LVL	10
L1DBD	Ash Coulee (ND)																				
	M-Acres	13.0	0.0	0.0	0.0	13.0	0.0	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	0.0	0.0	0.0	0.0	0.0
	Percent					100		100								100					
01912	Beartooth (MT)																				
	M-Acres	1.2	1.2	0.0	0.0	1.2	0.0	1.2	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Percent		100			100		100					100								
L1DAY	Bennett-Cottonwood (ND)																				
	M-Acres	13.8	0.0	0.0	0.0	13.8	0.0	13.8	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Percent					100		100	100												
L1DAK	Bell Lake (ND)																				
	M-Acres	12.5	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	0.0	0.0	0.0
	Percent					100										100					
01368	Black Butte (MT)																				
	M-Acres	0.9	0.9	0.0	0.0	0.9	0.0	0.9	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.9	0.9	0.0	0.0	0.0	0.0
	Percent		100			100		100					100			100	100				
L1DBJ	Bullion Butte (ND)																				
	M-Acres	17.8	0.0	0.0	0.0	17.8	0.0	17.1	17.8	0.0	0.0	17.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Percent					100		96	100			100									
01364	Burnt Mountain (MT)																				
	M-Acres	9.3	9.3	0.0	0.0	9.3	0.0	5.5	0.0	0.0	0.0	0.0	9.3	0.0	0.0	9.3	5.7	0.0	0.0	0.0	0.0
	Percent		100			100		59					100			100	61				
01370	Cook Mountain (MT)																				
	M-Acres	11.7	11.7	0.0	0.0	11.7	0.0	11.7	0.0	0.0	0.0	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0	0.0	0.0
	Percent		100			100		100							100						
01366	Fishtail Saddleback (MT)																				
	M-Acres	16.6	16.0	0.1	0.0	16.6	0.0	10.7	5.0	0.0	0.0	0.0	0.0	0.0	0.0	16.6	6.7	0.0	0.0	0.0	0.0
	Percent		96	1		100		64	30							100	40				
L1DAP	Horse Creek (ND)																				
	M-Acres	7.6	7.6	0.0	0.0	7.6	0.0	7.6	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Percent		100			100		100	100												
01372	King Mountain (MT)																				
	M-Acres	11.7	11.7	0.0	0.0	11.7	0.0	11.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0	0.0
	Percent		100			100		100								100					
L1DBI	Kinley Plateau (ND)																				
	M-Acres	19.4	0.0	0.0	0.0	19.4	0.0	19.4	19.4	0.0	0.0	0.0	19.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Percent					100		100	100				100								
01911	Line Crk Plateau (MT)																				
	M-Acres	20.7	20.0	0.0	0.0	20.7	0.0	16.5	20.7	0.0	0.0	0.0	20.7	0.0	0.0	0.0	15.8	0.0	0.0	0.0	0.0
	Percent		97			100		80	100				100				76				
L1DAX	Lone Butte (ND)																				
	M-Acres	7.1	0.0	0.0	0.0	7.1	0.0	7.1	7.1	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Percent					100		100	100				100								
01362	Lost Water Canyon (MT)																				
	M-Acres	9.8	9.8	0.0	0.0	9.8	0.0	9.8	9.8	0.0	5.0	9.8	9.8	9.8	9.8	0.0	0.0	9.8	0.0	0.0	5.0
	Percent		100			100		100	100		51	100	100	100	100			100			51
L1DBB	Magpie (ND)																				
	M-Acres	6.1	0.0	0.0	0.0	6.1	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0
	Percent					100		100							100						
01371	North Absaroka (MT)																				
	M-Acres	22.5	22.5	0.0	0.0	22.5	0.0	19.9	0.0	0.0	0.0	0.0	22.5	0.0	0.0	22.5	15.7	0.0	0.0	0.0	0.0
	Percent		100			100		88					100			100	70				
01363	Red Lodge Cr-Hellroaring (MT)																				
	M-Acres	14.8	14.8	0.2	0.0	14.8	0.0	10.7	0.0	0.0	0.0	0.0	14.8	0.0	14.8	0.0	7.5	0.0	0.0	0.0	0.0
	Percent		100	1		100		72					100		100		51				
01913	Rock Creek (MT)																				
	M-Acres	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	Percent		100			100							100		100						
L1DBL	Strom Hanson (ND)																				
	M-Acres	16.8	0.0	0.0	0.0	16.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.8	0.0	0.0	0.0	0.0	0.0
	Percent					100										100					
L1DAU	Twin Buttes (ND)																				
	M-Acres	9.0	9.0	0.0	0.0	9.0	0.0	0.0	0.0	9.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Percent		100			100				100		100									
L1DBE	Wannagan (ND)																				
	M-Acres	5.0	0.0	0.0	0.0	5.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
	Percent					100		100							100						
01369	West of Woodbine (MT)																				
	M-Acres	2.0	2.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0	1.6	0.0	0.0	0.0	0.0
	Percent		100			100		100		100						100	80				
	TOTAL ACRES	241.9*	129.1	0.3	0.0	241.9	0.0	182.1	93.6	11.0	11.8	36.6	105.9	9.8	47.6	105.3	18.8	53.9	9.8	0.0	11.8
	PERCENT		53	0.0	0.0	100	0.0	75	39	5	5	15	44	4	20	44	8	4	0	0	5

*This total does not include the Tongue River Breaks Roadless Area. This area was studied for wilderness by Congress through the Lee Metcalf Wilderness and Management Act of 1983. The Act states that this area has been adequately studied for wilderness. Therefore, this area is not included in the wilderness recommendation under any alternative.

less areas. Figure II-4 also portrays the current situation for wilderness and unroaded management on the Forest.

All alternatives except 3 and 5 recommend additions to the existing wilderness (Figure II-4). Alternative 4 recommends all areas for wilderness except the Tongue River Breaks Area. The remainder of the alternatives propose varying amounts of additional wilderness.

As previously mentioned, the alternatives were formulated to address various aspects of the unroaded management issue. Alternative 8 was formulated to portray a wilderness designation that would occur under Current Management. In this alternative those areas recommended for wilderness in RARE II would be so designated (Twin Buttes in North Dakota, and Lost Water Canyon in Montana). In addition the Tongue River Breaks would be managed as a roadless area to perpetuate the roadless values of the area.

Alternatives 7a and 7b were formulated to increase the production of commodity goods and services while at the same time significantly increasing the amount of wilderness. Alternatives 7a and 7b designates an additional 47,600 and 105,300 acres respectively to wilderness. Comparatively, alternatives 1 and 4 emphasize the production of wildlife and recreation outputs. These alternatives designate 129,100 and 241,500 acres, respectively to wilderness.

Alternatives 5a and 5b designates a significant increase in wilderness acres (182,100 in alternative 5a and 93,600 in alternative 5b) while maintaining market outputs at or slightly above current levels.

All alternatives except 2, 3, 5, 5c, and 7b designate Lost Water Canyon (9,800 acres) as wilderness. This area is contiguous to a larger roadless area administered by the Bureau of Land Management.

Alternative 10 (the Proposed Action) designates approximately 5,000 acres of the Lost Water Canyon Area as wilderness. The eastern half of this area comprises a portion of the Pryor Mountain Wild Horse Range which is administered by the BLM. This part of the Lost Water Canyon Area is not recommended for wilderness since this designation would conflict somewhat with wild horse management practices such as aerial roundups. This alternative adds approximately 6,800 acres to the existing Absaroka-Beartooth Wilderness through minor boundary adjustments in the vicinity of Burnt Mountain, Mystic Lake, and Timberline Creek.

b. Management of Inventoried Roadless Areas

Table II-3 shows how the inventoried roadless areas would be managed Forestwide under the different alternatives. Multiple-use management prescriptions were formulated by a Forest interdisciplinary team and used in the FORPLAN computer model as a means of displaying the management that would be applied to specific areas under different alternatives. These prescriptions range from wilderness, unroaded, to roaded. In addition to the areas proposed for wilderness classification, all alternatives include lands on which no development is planned for surface resources. These lands may be crossed with roads to access adjacent areas or to honor existing mineral leases, but will remain essentially unroaded. A summary of management emphasis is displayed at the end of the Table to portray how the inventoried roadless will be affected through time. The "developed" category indicates the rate of access into inventoried roadless lands.

Appendix C describes the wilderness qualities of the roadless areas and discusses the impact of nonwilderness designations upon the area's wilderness characteristics and qualities. Appendix C also discusses some of the economic, social, environmental, and amenity tradeoffs between a wilderness and nonwilderness management designation.

3. Visual Quality

Visual quality objectives are standards to which proposed changes in the character of the landscape can be compared to ascertain acceptability of the change. The preservation objective is applied to wilderness and other special areas where the natural landscape would be unaltered by forest mangement activities. The retention objective is applied to areas where activities should not be evident to the casual forest visitor, and partial retention to areas where activities may be evident but must remain subordinate to the natural landscape. Modification and maximum modification are applied to less visually sensitive areas where changes can dominate the natural landscape but should look natural from a distance.

The criteria developed to assure that management practices met visual quality objectives are described as standards and guidelines in the management prescriptions. These standards and guidelines are designed to reduce the visual impact of management activities.

The Existing Visual Condition (EVC) was mapped for the Forest, depicting the amount and severity of existing impacts of management activities. Predictions were made regarding the amount of additional impact each management prescription would produce, given the assigned visual quality objectives and the visual absorption capability of the analysis area. Comparison of the area of disturbed landscape (EVC class 4) gives an understanding of the visual management effects through time of each alternative. The area of EVC

TABLE II-3
MANAGEMENT EMPHASIS BY ALTERNATIVE FOR CUSTER NATIONAL FOREST ROADLESS AREAS (THOUSANDS OF ACRES)

MANAGEMENT EMPHASIS	ALTERNATIVES																
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10
Wilderness	129.0	0.3	0.0	241.7	0.0	182.0	93.6	11.0	11.8	36.6	105.8	9.8	47.6	105.3	18.8	9.8	11.8
Minimum Level Roadless	17.2	24.8	9.8	0.0	15.6	7.1	15.5	16.2	20.4	11.9	4.1	1.3	0.0	9.8	55.1	15.3	15.6
Disp. Rec/Wldl/ Roadless	0.5	50.7	71.5	0.0	57.1	13.2	44.3	75.8	65.1	62.3	28.3	59.7	63.7	37.9	38.8	61.3	29.2
Range/Wildl/ Roadless	0.0	39.1	39.1	16.6	40.0	16.6	40.0	40.0	40.0	40.0	40.0	22.6	16.6	16.6	40.0	40.0	69.9
Range/Wildl/ Minls/Rdless	99.1	14.0	0.0	0.0	44.8	9.0	26.1	52.5	0.0	5.9	9.2	9.5	0.0	0.0	50.9	0.0	0.0
Minerals Roaded	0.0	35.5	34.0	0.0	16.6	3.0	16.6	11.5	14.2	22.3	19.5	30.9	27.2	26.1	1.2	4.1	3.9
Wilf Wtr Rnge/Roaded	1.2	0.2	3.7	0.0	1.5	0.5	0.0	1.5	3.3	4.4	0.0	1.6	0.7	8.3	0.7	3.4	3.3
Timber/Forage Roaded	0.0	0.6	5.5	0.0	0.0	0.0	0.0	0.0	1.6	3.8	3.5	1.1	6.2	0.4	0.0	1.3	1.6
Timber Roaded	0.0	0.4	3.5	0.0	0.0	0.0	0.0	2.4	1.3	4.6	0.0	1.6	2.0	1.9	0.0	1.6	1.3
Range/Wildl Roaded	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.6	0.0	0.0	0.0	0.0	0.0
Range/Wildl/ Minls/Roaded	0.0	60.2	65.8	0.0	74.9	24.4	21.3	40.8	55.9	31.0	21.3	68.2	61.8	31.0	52.2	63.5	55.8
Wildlife Roaded	11.3	4.7	15.8	0.0	5.6	2.5	1.0	4.4	38.4	27.9	19.0	4.7	4.7	2.9	0.6	59.3	59.6
Range Roaded	0.0	28.2	9.6	0.0	2.2	0.0	0.0	2.2	6.3	7.6	7.6	31.7	27.8	18.1	0.0	6.3	6.3
Total	258.3	258.3	258.3	258.3	258.3	258.3	258.3	258.3	258.3	258.3	258.3	258.3	258.3	258.3	258.3	258.3	258.3

Summary of Management Emphasis Designated to Roadless Areas (Thousands of Acres)

MANAGEMENT EMPHASIS	ALTERNATIVES																
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10
Wilderness Mgt.	129.0	0.3	0.0	241.7	0.0	182.0	93.5	11.0	11.8	36.6	105.8	9.8	47.6	105.3	18.8	9.8	11.8
Roadless Mgt.	116.8	128.6	120.4	16.6	157.5	45.9	125.9	184.5	125.5	120.1	81.6	93.1	80.3	64.3	184.8	109.0	114.7
Decade 1	116.8	128.6	120.4	16.6	157.5	45.9	125.9	184.5	125.5	120.1	81.6	93.1	80.3	64.3	184.8	109.0	114.7
Decade 5	116.8	128.6	120.4	16.6	157.5	45.9	125.9	184.5	125.5	120.1	81.6	93.1	80.3	64.3	184.8	109.0	114.7
Developed	12.5	129.4	137.9	0.0	100.8	30.4	38.9	62.8	121.0	101.6	70.9	155.4	130.4	88.7	54.7	139.5	131.8
Decade 1	12.5	129.4	137.9	0.0	100.8	30.4	38.9	62.8	121.0	101.6	70.9	155.4	130.4	88.7	54.7	139.5	131.8
Decade 5	12.5	129.4	137.9	0.0	100.8	30.4	38.9	62.8	121.0	101.6	70.9	155.4	130.4	88.7	54.7	139.5	131.8

4 at the time of the mapping totalled 122,190 acres. The following Figure II-5 shows the accumulated "Disturbed" acres through time, and the reductions of the number of such acres as time and rehabilitation occur.

4. Research Natural Areas

The Forest currently administers two research natural areas (RNA). The two RNA's, Poker Jim on the Ashland Ranger District (Montana) and Two Top-Big Top on the Medora Ranger District (North Dakota) total approximately 463 acres. The Poker Jim area represents the eastern Montana ponderosa pine/bunchgrass ecosystems. The Two Top-Big Top area is within the badlands of North Dakota and iis characterized by a relic prairie ecosystem dominated by western wheatgrass, needle-and-thread grass and big sage. In addition, a number of areas are currently being evaluated for inclusion into the RNA system. These areas include a variety of ecosystems or special areas from the rolling prairie of North Dakota to the high alpine area of the Absaroka-Beartooth Wilderness. These areas are located in areas that will not present conflicts with other proposed land uses. All alternatives will maintain the existing RNA's and continue to evaluate other areas for inclusion.

FIGURE II-5

EXISTING VISUAL CONDITION CLASS 4 — DISTURBED

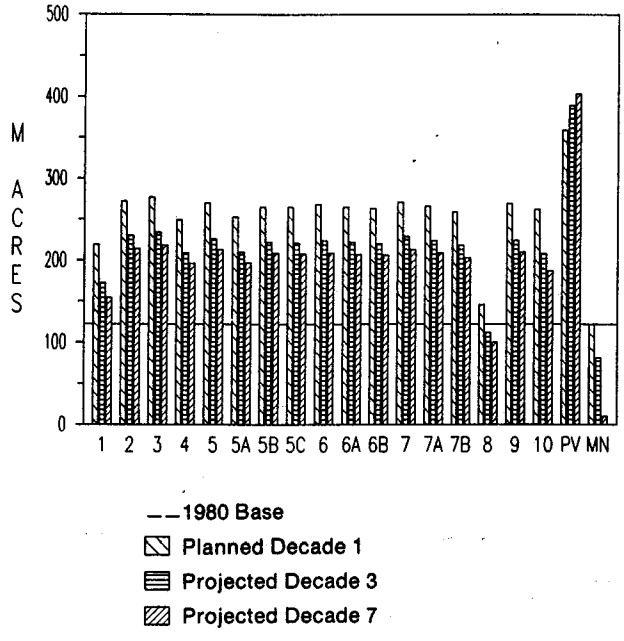
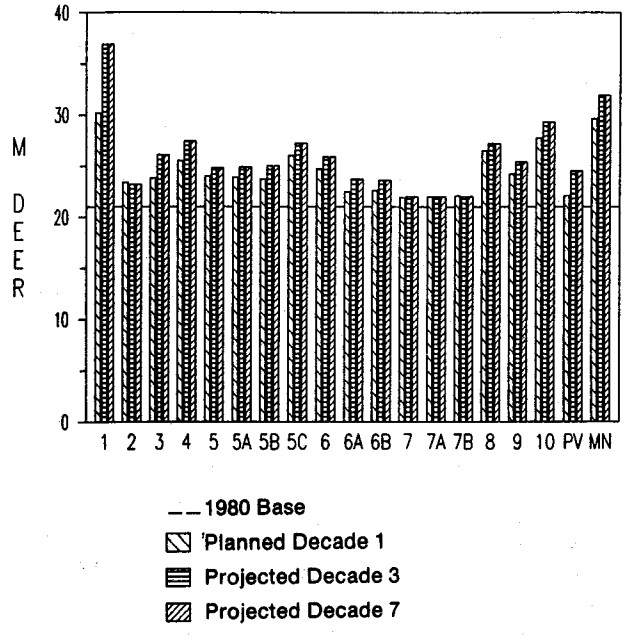


FIGURE II-6

DEER PROVIDED CAPACITY



5. Wildlife

All alternatives and benchmarks were designed to ensure the maintenance of minimum viable populations of wildlife and fish.

Mule deer and white-tailed deer are the wildlife species of greatest public interest on the Forest. The upland bird populations, including grouse and turkeys, run a close second in public concern. These species and their habitats were specifically analyzed through all alternatives. The riparian zones, woody draws, and timbered areas were the major habitat concerns for the deer and the residual nesting cover was important for the upland birds. Other wildlife species such as elk, bighorn sheep and grizzly bear were considered in the alternatives, but populations were projected for elk only.

The following chart, Figure II-6 shows the provided capacity for deer in each alternative. Provided capacity is based upon an "average year" concept whereby extremes of weather are eliminated. It is not intended to represent the actual count of animals. At any point, the actual population may be higher or lower. The relative change, or trend, in provided capacity is the most reliable use of these numbers. It is important to note that only Alternative 1 shows a large change in provided capacity. The other alternatives tend to remain about the same level. This is due primarily to the amount of investment and deliberate management needed to instigate a change in population, and the impacts of other activities on wildlife habitats. Wildlife management was specifically required in Alternative 1, thus the increase. The other alternatives did not have this constraint. Alternative 7 shows the greatest drop in population because of the lack of economic competitiveness by the wildlife resources with the market outputs.

For the prairie grouse (sharptail and prairie chicken), the change in effective habitat acres is reflective of changes in the quality of the habitats for these birds. The lack of population information restricts more detailed analysis. However, in a broad sense, the effective acres concept is valuable. For example, if the dancing grounds and nesting areas are protected, then the impacts to the population can be estimated.

Figure II-7 shows the changes in grouse effective acres for each alternative.

Elk populations occur on two of the Ranger Districts, Beartooth (Montana) and McKenzie (North Dakota). The continued expansion of oil and gas development causes concern for the herd in North Dakota. This herd originated from animals that left an area into which they had been introduced. The Montana herd is located on the Beartooth Ranger District and is estimated at 950 animals. Although these elk are not part of the Northern Yellowstone Ecosystem Elk Herd, they

FIGURE II-7

PRAIRIE GROUSE EFFECTIVE ACRES

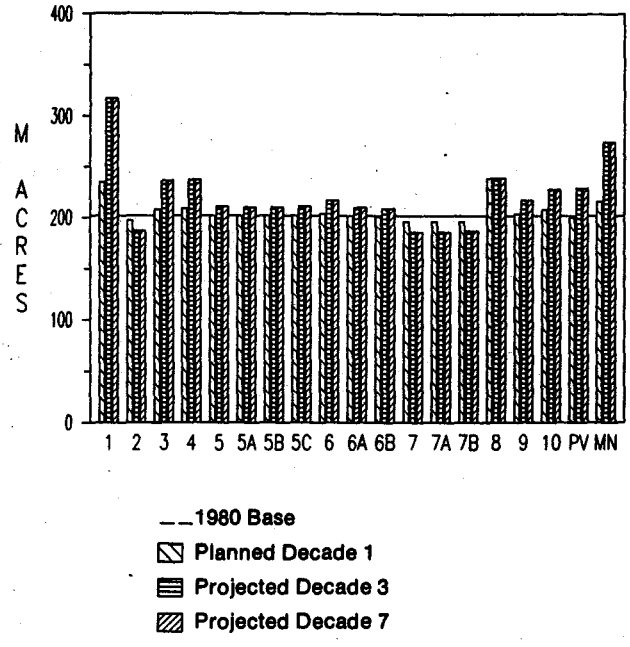
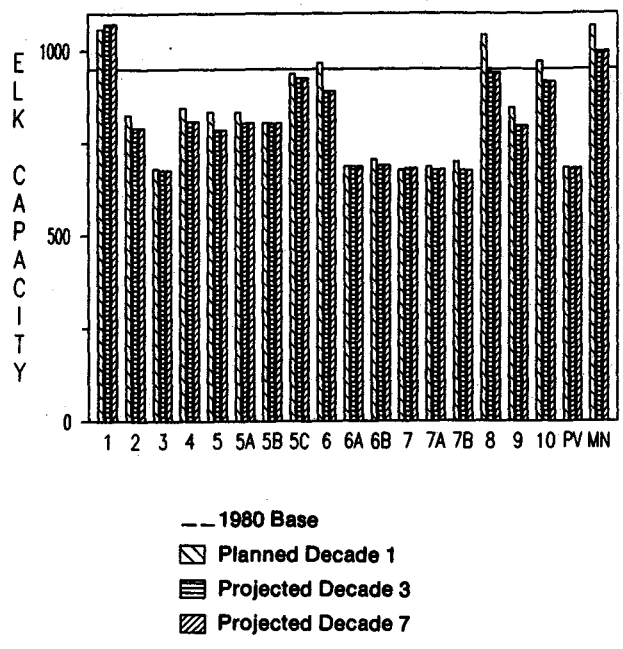


FIGURE II-8

ELK PROVIDED CAPACITY



do utilize portions of the Greater Yellowstone Ecosystem located in the Absaroka-Beartooth Wilderness as well as fringe area such as the Line Creek Plateau area. Most of this area is summer range with most of the winter range occurring on private land and adjacent Forest Service administered land in Wyoming. Portions of the Line Creek herd do winter on portions of the Custer National Forest. Figure II-8 indicates the projected population changes in the Montana herd. Generally, as the emphasis for market goods increases, the provided capacity for elk decreases. Alternatives 3 and 7 are good examples of this.

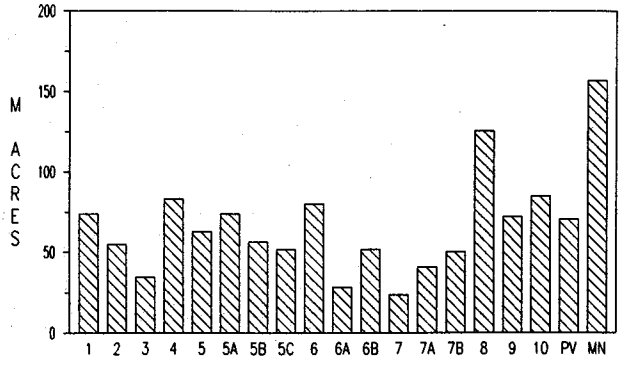
Old growth timber stands occur throughout the Forest. As Forest timber stands become regulated through harvest or other management activities, this habitat component will decrease. Within 75 years, this habitat component decreases to approximately 23,500 acres or 15 percent of the suitable timber base in Alternative 7. Current management, Alternative 8 would maintain the highest acreage (125,400 or 80 percent) in old growth of all of the alternatives. Alternative 10, the preferred alternative, would maintain approximately 84,600 acres or 54 percent of the suitable timber base in old growth by the end of the planning horizon. Additional old growth will be maintained outside the regulated timber base in wilderness, roadless and lands unsuitable for timber management. In 75 years, old growth dependent wildlife species will have greater amounts of this habitat component in Alternatives 1, 4, 8 and 10 (the Preferred Alternative). In Alternatives 3, 6a, 7, and 7a old growth would be less. The expected result is a reduction in these wildlife populations within the regulated timber base. The amount of old growth habitat occurring in wilderness or other areas where timber will not be harvested is dependent upon the potential of the sites to produce trees and their potential conversion to younger successional stages by fire, insects or disease.

Since animals are a product of their environment, the maintenance of a diverse vegetative community results in a diverse community of wildlife species. Old growth habitat can only be provided by retaining a portion of the forest's old growth timber, other vegetative age classes can be maintained through timber harvest. After stands are harvested and regenerated, they grow through stages of vegetative development to become mature forests. As the forest changes structure, wildlife species inhabiting the forest change. When the total Forest is considered, there will be an ever-changing mosaic of different vegetative structures. The inherent diversity caused by geology and topography is enhanced by the diversity created by timber harvest, fire, disease and insects. All alternatives and benchmarks provide diverse habitats, with the high timber output alternatives having more early seral stage area and less old growth than the lower timber output

alternatives. Figure II-9 shows the acres of old growth remaining in the suitable timber base in 75 years, the end of the planning horizon.

FIGURE II-9

ACRES OF TENTATIVELY SUITABLE TIMBER BASE IN OLD GROWTH



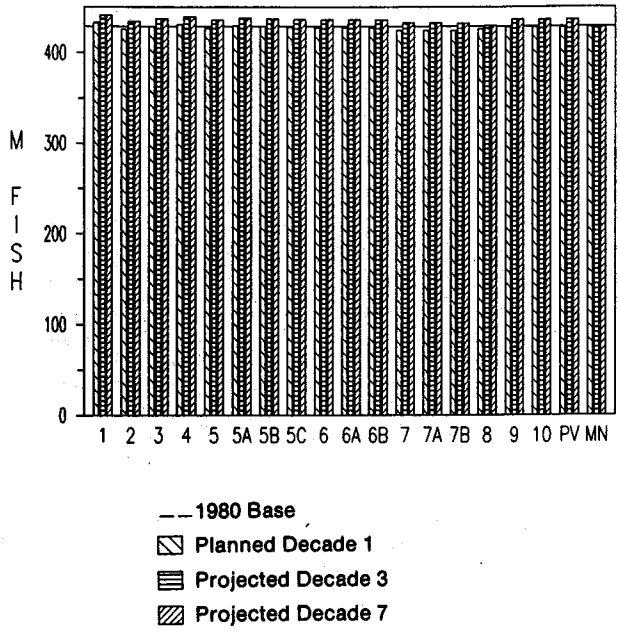
6. Fish

The primary effects that the various alternatives can have on fisheries include; loss of effective bank cover along streams caused by livestock grazing, sedimentation from road construction, and possible salt contamination from potential blowouts from oil and gas exploration and development. In addition, the improvement of stream and lake habitats from the proposed habitat improvement program would have a positive effect on fish numbers. Much of the Forest's coldwater fisheries are located within the Absaroka-Beartooth Wilderness. Therefore, it is expected that the degree of impact on the overall total fish numbers resulting from planned activities would be minimal and would vary little among the alternatives.

With the exception of those trout population located outside the wilderness boundary and in a number of small ponds, the remainder of the fisheries on the Forest involves warm water fish. Lake and pond shoreline vegetation is important in maintaining the ability to sustain and propagate viable fish species. Therefore, the alternatives that emphasize wildlife management particularly in relation to livestock activities produce the greater amounts of warm water fisheries. These alternatives are Alternatives 1 and 4. The alternatives particularly detrimental to these fisheries are Alternatives 7 and 8. Figure II-10 shows the planned and projected fish numbers by alternative.

FIGURE II-10

ESTIMATED COLD AND WARM WATER FISH POPULATION



7. Threatened and Endangered Species

Informal consultation was maintained with the UDSI, Fish and Wildlife Service, Threatened and Endangered Species Section during the analysis portion of the development of the Forest Plan. Formal consultation on the Forest Plan was requested on April 29, 1985. The biological opinion returned was that the implementation of the Plan is not likely to jeopardize the continued existence of the listed species that could occur on the Custer National Forest. Informal consultation continued on the changes made in the plan from draft to final. The response was that the biological opinion was not affected by these changes.

a. Grizzly Bear

The grizzly bear on the Custer National Forest occupies part of the habitat of the Greater Yellowstone Ecosystem. This ecosystem is comprised of Yellowstone and Grand Teton National Parks, portions of the Targhee, Bridger-Teton, Shoshone, Gallatin and Custer National Forests, and intermingled private lands. On the Custer National Forest, there are 5,507 acres classed as Management Situation (MS) I and 105,000 acres as Management Situation II. Coordination was maintained with all other public land management agencies during the evaluation of management areas, and development of program direction. A total of 99,493 acres of MS-II are located within the existing Absaroka-Beartooth Wilderness Area. The rest of the MS-II area and all of the MS-I areas is outside of the wilderness boundary.

Table II-4 shows the breakdown of the habitat.

Estimates of grizzly bear densities are based upon the best information available but are still only estimates. Information from research indicates that the potential for bears in the YGBE is approximately 316 bears (one bear per 28 square miles). Recovery goals state that there should be at least 25 females with cubs of the year, and the reproductive rates should be 2.2 cubs per female.

The present grizzly bear population can only be estimated. In 1959, Craighead and others (1974) estimated the population of grizzly bears in the Yellowstone Ecosystem to be 222 bears. This is a density of one bear to 38 square miles of occupied habitat. Craighead and others (1976) documented a population increase from 1959 to 1967 from 222 to 245 bears, and then a decline from 1967 to 1974 from 245 to 136 bears. The most recent estimate of bears is 197 (Knight et al. 1982). There is some concern that this estimate is too high. Using a simple acreage calculation, the Custer National Forest would be able to support 6 bears under a maximum density (one bear per 28 square miles) or 5 bears under a density of one bear per 38 square miles.

Of the total acres of occupied habitat on the Forest (110,511 acres) 94% occur within the Absaroka-beartooth Wilderness (103,724 acres). This wilderness was maintained in all alternatives. In addition, under all alternatives the acres of occupied habitat outside of wilderness (6,787 acres) were maintained.

The Forest does not provide suitable habitat to accomodate a self-sustaining population of grizzly bears on a year-round basis. However, when viewed as part of the larger adjoining area of grizzly bear habitat, the Forest would help to achieve a recovered population as a minimum requirement in *all alternatives* by providing the seasonal needs for an estimated population of four grizzly bears, based on average density figures in the *"Guidelines for Management of the Grizzly Bear in the Greater Yellowstone Ecosystem."*

Man-caused mortality of grizzly bear and the reduction in secure habitat are the major limiting factors in the recovery of the bear in the Greater Yellowstone Ecosystem. The effects of alternatives on the security of the grizzly bear were assessed by determining the amount of activities causing disturbance within occupied habitat. The seasonal needs for the maintenance of a population of four grizzly bears would be achieved under all alternatives since there is no timber harvest, livestock grazing, or roading planned in grizzly bear habitat in any of the alternatives.

In order to facilitate recovery, all Forests have a target of 0 preventable grizzly bear mortalities. A preventable mortality is one which could have reasonably been avoided by management activities and is not a legal hunting mortality. Since 1980 there have been no grizzly bear mortalities on the Custer National Forest. Table II-5 indicates the past mortalities that could have been prevented.

b. Black-footed Ferret

At present, there are no known populations of black-footed ferrets on the Custer National Forest. However, past sightings or sign have been observed on the Forest. Since most sightings have occurred in or close to prairie dog towns, these areas are considered as having the potential for black-footed ferret occupancy. The current acreage of prairie dog towns on the Forest is estimated at 5,000 acres. In 1979 the Forest Service designated seven prairie dog towns as essen-

TABLE II-4
YELLOWSTONE GRIZZLY BEAR ECOSYSTEM
OCCUPIED HABITAT ACRES

Administrative Unit	MS-I	MS-II	MS-III	Total
National Park Service	2,317,146	—	2,355	2,319,501
Bureau of Land Management		——— Unstratified ———		3,400
Private		——— Unstratified ———		54,845
Forest Service	1,670,606	1,545,163	24,600	3,240,369
Gallatin NF	413,209	354,339	1,100	768,648
Custer NF	5,507	105,004 (1,280 outside Wilderness)	0	110,511
Shoshone NF	412,000	819,600	17,400	1,240,000
Bridger-Teton NF	678,500	50,500	5,100	734,100
Targhee NF	171,390	217,000	1,000	389,390
TOTAL	3,987,752	1,545,163	26,995	5,559,910

TABLE II-5

NUMBER OF GRIZZLY RELOCATIONS AND MORTALITIES (1981-1984)

Type of Loss	Total Yellowstone Ecosystem	Gallatin N.F.	Custer N.F.
Relocation Outside the Ecosystem	5	1	0
Mortalities			
Natural Causes*	5	0	0
Management Removal	10	2	0
Illegally Shot**	10	4	0
Total Reduction in Grizzly Numbers	30	7	0

*(Instances that are known)
**(Preventable mortalities)

tial habitats. There were no observations of ferrets at that time, and none of these towns met the minimum requirements of size and distribution as set forth by C. Hillman as necessary to support a population of black-footed ferrets over time.

In 1982, a prairie dog management plan was developed that set a figure of 3,000 acres as naturally-occurring on the Forest. This plan also established procedures for consideration of black-footed ferrets and their habitat needs in management of prairie dog towns.

The guidelines established in this pairie dog management plan were incorporated into the constraints for all alternatives. The potential for black-footed ferrets remained the same under all alternatives.

c. Peregrine Falcon

There is one historical and one probable peregrine eyrie on the Forest. Surveys in recent years, ncluding a helicopter survey in 1984, have not provided confirmed sighting of a peregrine falcon on the forest. However there have been consistent reports of possible sightings in the Pryor Mountains. As part of the endangered species program, 120,800 acres were designated as essential habitat for the peregrine falcon in 1978. This designation was based upon a radius centered upon the one known nesting site and included a general consideration of the prey base for the falcon.

Mineral leasing stipulations and seismic timing constraints in all alternatives afford protection of these nest sites.

d. Bald Eagle

Although there are no known nesting sites on the Forest, bald eagles do use portions of the Forest as winter roost areas. In addition, the Forest has designated 41,500 acres of essential habitat for bald eagles which is located in two areas, the southern end of the Long Pines in southeastern Montana, and in McKenzie county in North Dakota. Management activities that could affect this species the most would be timber harvest, roading, and mineral extraction. Alternatives such as Alternatives 2 and 7 that emphasize the production of commodity goods and services, would have the most potential for adverse impacts to this species. Current mineral leasing requirements (leasing stipulations) provide protection to these areas under all alternatives.

e. Gray Wolf

There are no known gray wolves on the Custer National Forest or in the Greater Yellowstone Ecosystem. However, the Yellowstone Ecosystem has been identified as potentially suitable for the recovery of the gray wolf. Current evaluations indicates there are no suitable winter habitats for wolves on the Forest. The ability of the Forest to aid in the recovery of the gray wolf would not be affected by any of the alternatives.

f. Whooping Crane

Portions of the Forest, principally the Litle Missouri National Grasslands, underlay the migration routes of whooping cranes. The cranes may use these lands occassionally as resting areas during either the fall or spring migration. There have been two reports of whooping cranes on the forest, one in 1975 and one in 1961. Because of the occassional and sporadic use of the Forest by these birds no area has been designated as essential habitat. This species would not be affected by any of the alternatives.

g. Interior Least Tern

There are no known reports of interior least terns on the forest. Habitat for the bird consists of relatively large sandbars which are isolated from the shoreline. This habitat does not occur often on the forest, however there may be some suitable habitat along the Little Missouri River. This species would not be affected by any of the alternatives.

h. Piping Plover

There are no known reports of piping plovers nesting on the forest. Habitat for this bird is on dredge sites, river islands and on alkali lakes. These habitats are quite limited on the forest, however there may be some suitable habitats along the Little Missouri River. This species would not be affected by any of the alternatives.

8. Range

Forage for livestock and wildlife is one of the important resources of the Forest. During the planning process, the available forage for livestock and the competition for that forage between livestock and wildlife were evaluated. While the Forest has a great capability to produce forage, increased production requires intensive management, including grazing systems, structural

and non-structural improvements, and greater investments on the part of the Forest and the livestock producers. Some alternatives utilize timber harvest to create additional forage. The potential range forage as shown in Figure II-11 is the amount of forage available for livestock consumption that results from a combination of management strategies in each alternative. Alternatives 7, 7a, and 7b produce the greatest amount of forage in response to the emphasis on market goods. Alternative 2, which attempts to meet RPA projections, also produces a high level of forage. Alternative 1 produces the lowest amount of livestock grazing due to a higher percentage of the forage being allocated to wildlife consumptive and nonconsumptive needs. Livestock grazing is also reduced in this alternative in response to the emphasis of management of riparian areas and woody draws for wildlife habitat. Alternative 10 (the Preferred Alternative) effectively maintains livestock numbers at or near current levels.

Figure II-11 shows the projected amount of forage that could be available for livestock consumption in each alternative.

9. Timber Production

Timber production on the Forest is not a major program, although the management of the timber must be done cost-efficiently and usually to benefit other resources such as wildlife or to aid in the control of insect and disease. Harvest volumes and schedules were calculated by the FORPLAN computer model in response to the theme of the alternatives. Figure II-12, Figure II-13, Table II-6, and Table II-7 show the changes in harvest volumes over time for the different alternatives.

All land managed by the Forest was tested for suitability for production of timber by applying the criteria discussed in Appendix B, Section II. Tentatively suitable timberlands were assigned prescriptions that met the management objectives of a given alternative. High timber output alternatives have the most acreage assigned to timber production (Table II-8) and emphasize the clearcut silvicultural system over shelterwood, or individual tree selection harvest methods.

Two silvicultural systems are associated with timber harvest: even-aged and uneven-aged. Both of these broad systems are available and were selected for use in many alternatives. The choice of harvest systems depends on habitat type, visual quality objective, and the goal for management of the area. Selective harvest systems are used to enhance wildlife values and protect other key resource values in areas such as riparian zones. Even aged harvest systems (clearcut and shelter wood/seed tree systems are commonly used where even-aged harvest is desired. Sales requiring large amounts of uneven-aged harvest systems to protect other resources

FIGURE II-11

POTENTIAL LIVESTOCK FORAGE

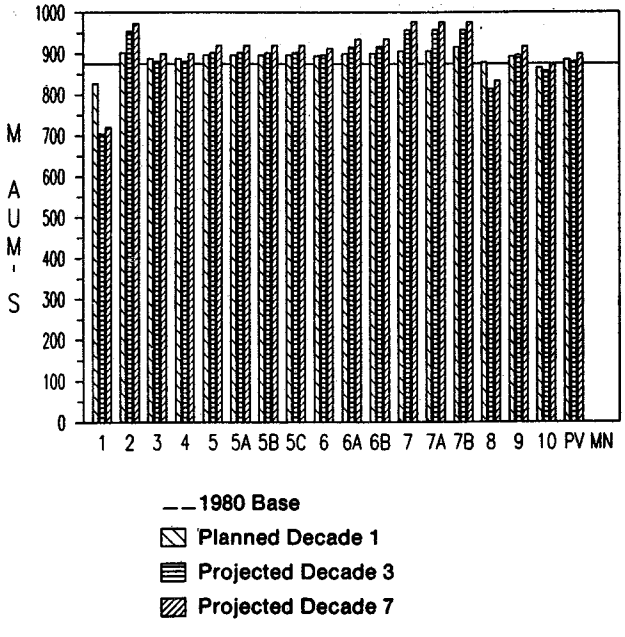


FIGURE II-12

ALLOWABLE TIMBER SALE QUANTITY
(Millions of Cubic Feet)

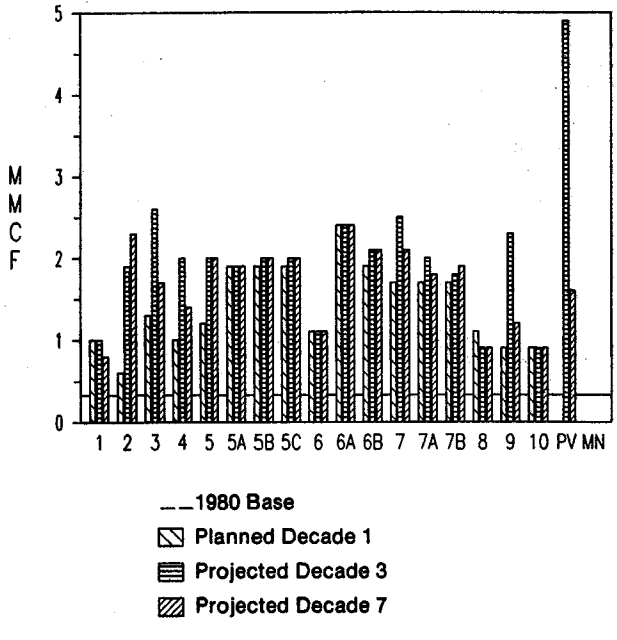
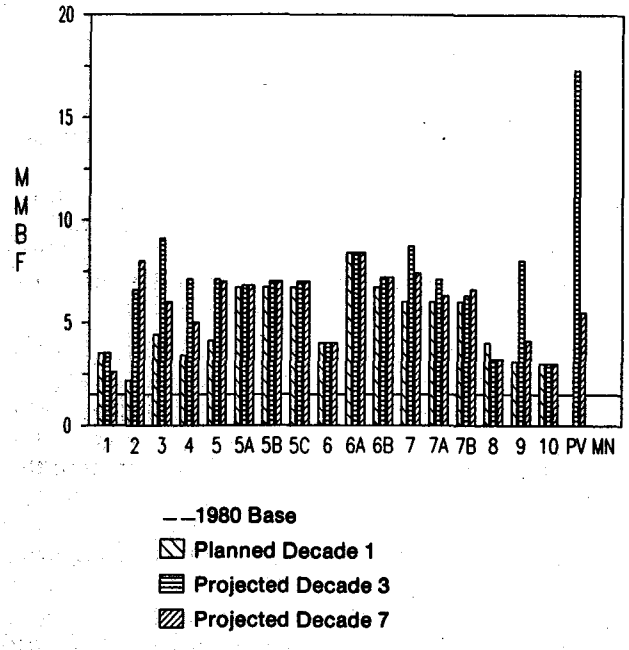


FIGURE II-13

ALLOWABLE TIMBER SALE QUANTITY
(Millions of Board Feet)



are more apt to be below cost sales than where even-aged systems are used due to decreased volume per acre harvested. Some below cost timber sales are anticipated where the objective is to enhance other resource values and harvest volumes per acre are light. Chapter IV discussed the differences in impacts by system and also the amount of harvest by system anticipated. Silvicultural systems that are appropriate by habitat type are found in Appendix I of the Forest Management Plan. The silvicultural system will be determined based on the objectives of management for the area, on the ground conditions, and with the approval of a certified silviculturist.

Figure II-14 shows the total acres to be harvested and Table II-8 show the acres harvested by harvest method for the different alternatives for the planning horizon.

10. Watershed

Major concerns for water/watershed resources are protecting water quality and maintaining the soil's capability. The risk of degrading water quality through resource management activities is mostly due to increased sediment. These increases are generally caused by construction activities whether in conjunction with timber harvest and mineral development (e.g., oil well roads and pads), or by livestock grazing. Climatic conditions are such that except for the Beartooth Mountains, no measurable increases of water runoff will occur as a result of timber harvest activities.

TABLE II-6

ALLOWABLE TIMBER SALE QUANTITY
(MILLION CUBIC FEET)

	ALTERNATIVE/BENCHMARK																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	CM 8	9	PA 10	MAX PNV	MIN LVL
Base timber sale schedule	MMCF																		
Decade 1	1.1	0.6	1.3	1.0	1.2	1.9	1.9	1.9	1.1	2.4	1.9	1.7	1.7	1.7	1.1	0.9	0.9	0.0	0.0
Decade 3	1.0	1.9	2.6	2.0	2.0	1.9	2.0	2.0	1.1	2.4	2.1	2.5	2.0	1.8	0.9	2.3	0.9	4.9	0.0
Decade 5	0.8	2.3	1.7	1.4	2.0	1.9	2.0	2.0	1.1	2.4	2.1	2.1	1.8	1.9	0.9	1.2	0.9	1.6	0.0
Decade 7	0.8	2.3	1.7	1.4	2.0	1.9	2.0	2.0	1.1	2.4	2.1	2.1	1.8	1.9	0.9	1.2	0.9	1.6	0.0

TABLE II-7

ALLOWABLE TIMBER SALE QUANTITY
(MILLION BOARD FEET)

	ALTERNATIVE/BENCHMARK																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	CM 8	9	P 10	MAX PNV	MIN LVL
Base timber sale schedule	MMBF																		
Decade 1	3.5	2.2	4.4	3.4	4.1	6.7	6.7	6.7	4.0	8.4	6.7	6.0	6.0	6.0	4.0	3.1	3.0	0.0	0.0
Decade 3	3.5	6.6	9.1	7.1	7.1	6.8	7.0	7.0	4.0	8.4	7.2	8.7	7.11	6.3	3.2	8.0	3.0	17.3	0.0
Decade 5	3.5	8.8	9.2	7.6	7.0	7.0	7.0	7.0	4.0	8.4	7.2	11.2	9.6	10.0	3.2	6.5	3.0	15.9	0.0
Decade 7	2.6	8.0	6.0	5.0	7.0	6.8	7.0	7.0	4.0	8.4	7.2	7.4	6.3	6.6	3.2	4.1	3.0	5.5	0.0

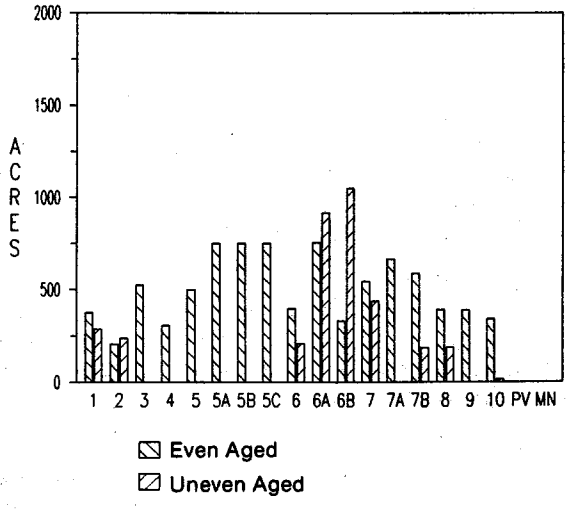
TABLE II-8

ACRES HARVESTED BY HARVEST TECHNIQUE
(ACRES PER YEAR BY DECADE)

	ALTERNATIVE/BENCHMARK																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	CM 8	9	PA 10	MAX PNV	MIN LVL
Even-Aged Harvest Acres																			
Decade 1	374	206	523	306	499	751	751	751	397	755	332	545	665	587	389	388	340	000	000
Decade 3	136	000	421	578	290	103	332	365	129	601	508	405	428	246	163	720	149	1316	000
Decade 5	269	1122	1198	914	1012	984	1016	1016	406	883	670	1142	902	961	326	594	268	2266	000
Decade 7	55	696	656	664	284	825	768	735	93	1072	541	843	708	927	245	476	169	915	000
Selection Cut Acres																			
Decade 1	286	237	000	000	1	000	000	000	209	916	1051	438	000	185	188	000	15	000	000
Decade 3	770	2214	1368	429	1249	1513	1321	1394	966	1328	961	1745	1266	1243	499	268	431	558	000
Decade 5	286	000	000	000	000	000	000	000	.000	253	410	000	000	000	000	000	000	000	000
Decade 7	714	1576	1047	213	1492	1216	910	1139	1104	1093	1114	1311	1054	868	392	337	602	254	000

FIGURE II-14

TIMBER HARVEST ACRES BY HARVEST TECHNIQUE



Additional runoff does occur from road surfaces and newly constructed road cuts and fills on all districts. These impacts have been considered in evaluating water-related impacts of the various alternatives.

Large volumes of sediment are lost annually from the badlands of North Dakota. Much of this comes from unvegetated areas where some 3+ tons/acre are produced naturally. Approximately 1 ton/acre is lost annually from typically vegetated rangeland of the Custer National Forest. Differing range management direction and grazing intensity in the various alternatives will cause reductions or increases in sediment losses.

Timber harvest in the Beartooth Mountains does have the potential to cause additional runoff. The estimated maximum increase is 3 inches/acre in the years immediately after clearcut harvest. Normal runoff from the area averages 22 inches per year. Much smaller increases are expected from selection harvest. The actual risk of increasing sediment yield will vary depending on the amount of soil disturbed, type of surface treatment, soil material, and various other physical, chemical, and biological factors. As roads stabilize and disturbed sites revegetate, sediment production decreases. Most sediment production decreases to very low levels within one or two time periods of the disturbance if revegetation is done expediently.

Alternatives are listed in Table II-9 in ascending order of their relative risk of producing increased sediment. This ranking was based on a combination of the factors of livestock grazing, road construction, acres of timber management, and cumulative oil production. Livestock grazing is a major resource activity on the Forest, and it was considered to be the factor with the greatest potential for sedimentation since it occurs throughout the Forest except in existing wilderness. Road construction, timber management, and oil production respectively have somewhat less potential for generating sedimentation. Management practices will be used in all alternatives to accomplish Forest Plan goals, one of which is to meet and/or exceed State water quality standards. These practices are referred to as Best Management Practices (BMP's). (For a definition of BMP's refer to the glossary in Chapter VII of this document). Due to their higher sediment production potentials, it would be more costly to meet Forest water quality goals for Alternatives 2, 7, 7a, and 7b, and there would be greater risk that water quality might be impacted in spite of the application of BMP's.

Under this ranking system, Alternative 8 has the least threat of impacting water quality. This alternative builds fewer roads, and has the least

TABLE II-9
ESTIMATED RELATIVE SEDIMENT RISK-ALTERNATIVE RANKING

Alternative	Total Roads* (Miles)	Acres Suitable For Timber Mgmt. (M Acres)	Livestock Grazing** (M AUMs)	Cumlative Oil Production*** (MM Barrels)
8 CM	4,400	31	833	167
1	4,447	83	728	302
4	4,448	74	898	315
10 PA	5,650	72	875	316
5	5,098	94	920	334
6	5,203	77	913	337
5a	5,295	83	919	326
5b	5,273	100	919	330
5c	5,285	104	919	331
9	5,666	85	914	338
6b	5,628	105	934	332
3	5,685	122	898	345
6a	5,664	128	933	336
7b	5,639	106	975	331
2	5,685	102	973	345
7a	5,678	116	975	342
7	5,685	133	977	344

*Includes 3803 miles of existing roads.

**Decade 5 projections are used as an appropriate index of livestock use to rank potential risk of each alternative.

***Cumulative oil production is total estimated oil production over the entire planning horizon.

number of acres impacted by timber production. Oil production is the lowest of all alternatives due to the exclusion of oil production from many of the existing roadless areas by surface occupancy cut-off dates. Livestock grazing in this alternative is slightly less than current permitted numbers. Alternatives 2, 7, 7a, and 7b would have the greatest sediment risk because of the increase in livestock grazing, the large area affected by timber management activities. These alternative also schedule the greatest number of roads to be built. The preferred Alternative, Alternative 10, has one of the lowest risks (fourth) due to the maintenance of grazing at current levels and the moderate level of timber production and road construction.

State and Federal Water Quality Standards will be met in the Redlodge Creek municipal watershed. Standards for activities in this watershed are included in the Forest Plan and these standards apply to all alternatives.

Monitoring will be done during project development to track sediment production. The effects of sediment production on water related beneficial uses will be evaluated during project development to ensure meeting Forest water quality goals.

"Best Management Practices" would be used in all alternatives to carry out activities and to assure that they would accomplish Forest Plan goals, one of which is to meet or exceed State water qualtiy standards. These practices are also referred to as "Conservation Practices" and are available in draft form in the Forest Service Soil and Water Conservation Handbook 2509.22.

11. Minerals

Geologic favorability and access categories for both energy and nonenergy resources have been evaluated for the Forest. Energy and nonenergy resources are defined as:

Energy: resources include oil and gas only.

Nonenergy: resources include precious metals, base metals, nonenergy leaseable minerals, and common variety materials.

The four categories of geologic favorability are:

Very High: Areas where a number of geologic characteristics are present that indicate the occurrence of a given resource. Unfavorable characteristics are few or absent. At least some characteristics are diagnostic of a particular mineral deposit. Information on past, present, and planned activity in the area supports or reinforces the areas's geologic favorability.

High: Areas where a number of geologic characteristics are present that indicate the occurrence of a given structure.

Moderate: Areas where some geologic characteristics are present that are favorable for the occurrence of a given resource.

Low: Areas where a few geologic characteris-

tics favorable for the occurrence of a given resource are present.

Using the above information the Forest lands were placed in four categories:

Category A Totally Restricted: Statutory or discretionary withdrawals from mineral entry or mineral leasing. Examples of these lands would be:

- Wilderness areas
- Wild and scenic rivers
- MS I Grizzly Bear habitat

Category B Highly Restricted: Access to mining claims will be difficult and costly. Leases will have surface occupancy restrictions.

- Congressionally mandated wilderness study areas
- T&E species habitats
- Roadless management areas
- Research natural areas
- Environmentally sensitive areas such as areas of mass failure, or steep slopes

Category C Moderately Restricted: Leases and operating plans usually show seasonal stipulations.

- Calving and lambing areas for elk and big horn sheep
- Visually sensitive areas
- Elk winter range
- Grouse dancing grounds

Category D Standard Restrictions: All practices in accordance with standard Forest Service operating procedures and mandated environmental protection measures.

- Rolling grasslands
- Areas of low environmental risk.
- Timber sale areas

The amount of the high and very high potential energy mineral lands available for development, with only standard Forest wide surface protection requirements (Category D), varies from a low of 13 percent in Alternative 1 to a high of 73 percent in Alternative 7. The Preferred Alternative 10 has 63 percent of the high and very high oil and gas potential lands completely available for development with only standard restrictions.

The amount of high and very high potential lands that are completely unavailable for oil and gas development because of statutory or discretionary withdrawals (Category A) varies from a low of 4 percent in Alternatives 2, 3, 5, 6, 7, and 9 to a high of 17 percent in Alternative 4. The Preferred Alternative 10 has 10 percent of the high and very high completely unavailable for oil and gas development.

With the exception of the Beartooth Ranger District the potential for hardrock minerals on the Forest is low. The Beartooth District contains portions of the Stillwater Complex, an area high in deposits of the strategic minerals of platinum, palladium, and chromite. The percent of high and very high potential of hardrock (non-leasable minerals) mineral lands available for development with only standard Forest wide restrictions (Category D) varies from a low of 17 percent in Alternative 7b to a high of 50 percent in Alternative 8. The Preferred Alternative 10 has 29 percent of the high and very high potential hardrock minerals available with only standard Forest wide mitigation requirements. The percent of high and very high potential hardrock mineral lands available for development with statutory or discretionary withdrawal requirements (Category A) varies from a low of 45 percent in most of the alternatives to a high of 70 percent in Alternative 7b. The Preferred Alternative 10 has 45 percent of the high and very high potential hardrock minerals available for development with these restrictions.

A detailed listing of acres of very high, high, moderate, and low potential lands in the four management classes of A, B, C, and D is given is Table II-10 and Table II-21 at the end of this Chapter.

12. Road System

Summary of Changes Between the Draft EIS and Final EIS

In response to the public comments, this section has been expanded to clarify the discussion on the kinds of roads to be constructed on the Forest in the future. A discussion of future road management has been added to clarify how many of the existing and future roads will be managed. Figure II-16 has also been added to show the amount of road construction planned for decade 1 and projected for future decades.

Under the current situation, (1980) there are approximately 3,803 miles of road inventoried on the Custer National Forest. Many of these roads have been constructed to access oil and gas development especially on the Little Missouri National Grasslands. While not physically closed to the general public, many of these roads are issued under Special Use permits to the leaseholders. They are considered as private roads which will be closed in time after they are no longer needed for the management of oil and gas. In addition, some of the existing Forest System roads are closed seasonally for wildlife considerations, or to protect the roadbed during extremely wet conditions.

One of the items that varies by alternative is the total number of miles of road needed for managing the Forest over the 75 year planning horizon. Figure II-15 shows the projected total miles of road needed for each alternative. This total includes the 3,803 miles of existing system roads and the new roads projected for construction over the next 75 years.

TABLE II-10

ACRES OF LOCATABLE MINERAL AND LEASABLE ENERGY RESOURCE POTENTIAL (THOUSAND ACRES)

		Potential for Hardrock Minerals				Potential for Oil and Gas			
Alt.	Category	Low	Moderate	High	Very High	Low	Moderate	High	Very High
1	A	247.4	147.2	41.7	1.0	163.1	112.0	184.8	9.0
	B	0.0	0.0	0.0	0.0	2.3	0.0	16.1	235.2
	C	351.6	16.4	4.4	1.1	122.2	85.3	465.8	782.0
	D	357.6	3.4	9.7	4.9	9.5	4.1	253.6	1.8
2	A	221.1	99.5	28.4	0.0	149.8	112.0	78.3	0.0
	B	0.0	0.0	2.3	0.0	12.1	0.0	0.0	0.0
	C	4.0	0.0	0.0	0.0	29.5	9.7	136.1	316.0
	D	731.4	67.5	25.2	7.0	105.6	79.7	705.8	712.0
3	A	221.1	99.2	28.4	0.0	149.8	112.0	78.0	0.0
	B	0.0	0.0	2.5	0.0	12.1	0.0	0.0	15.0
	C	346.3	28.1	7.5	1.9	31.6	70.4	411.9	344.9
	D	389.2	39.7	17.7	5.1	103.6	19.0	430.3	668.0
4	A	288.1	147.2	41.7	1.0	163.1	112.0	202.7	120.4
	B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.1
	C	265.6	6.9	2.0	0.7	28.7	68.3	286.5	243.4
	D	402.8	12.9	12.1	5.3	105.3	21.1	431.0	612.0
5	A	221.1	99.5	28.3	0.0	149.8	112.0	78.0	0.0
	B	0.0	0.0	2.3	0.0	12.1	0.0	40.0	66.1
	C	69.4	24.7	6.6	1.7	39.1	12.5	153.1	264.5
	D	666.0	42.8	18.7	5.4	96.1	76.8	649.1	697.3
5a	A	268.7	144.8	35.9	1.0	160.8	112.0	167.6	81.5
	B	0.0	0.0	2.5	0.0	2.3	0.0	16.6	40.5
	C	26.1	5.0	1.8	1.2	35.1	13.6	102.6	241.7
	D	661.8	17.1	15.9	4.8	98.8	75.8	633.5	661.2
5b	A	239.2	166.6	28.4	0.0	159.6	112.0	103.7	58.0
	B	0.0	0.0	2.3	0.0	2.3	0.0	40.0	54.1
	C	40.0	11.3	3.4	1.4	43.6	12.5	131.9	264.3
	D	677.3	39.1	21.8	5.6	91.6	76.9	644.6	651.3
5c	A	221.1	99.2	29.4	1.0	149.8	112.0	80.0	9.0
	B	0.0	0.0	2.3	0.0	12.1	0.0	40.0	76.1
	C	75.6	7.0	3.1	2.1	28.4	15.3	132.6	263.0
	D	659.8	60.8	21.2	3.9	106.8	74.1	668.6	679.8
6	A	230.9	99.2	28.4	0.0	159.6	112.0	78.0	0.0
	B	0.0	0.0	2.3	0.0	2.3	0.0	40.0	74.3
	C	89.0	22.2	8.9	4.4	30.1	15.3	239.4	307.0
	D	636.6	45.7	16.4	2.6	105.1	74.0	562.8	646.7
6a	A	230.9	99.1	28.4	0.0	159.6	112.0	78.0	26.8
	B	0.0	0	2.3	0.0	2.3	0.0	40.0	43.0
	C	65.8	7.2	2.9	1.4	31.2	13.1	132.9	245.3
	D	659.8	60.6	22.4	5.6	104.0	76.2	678.3	712.9
6b	A	248.1	138.8	31.7	0.0	163.1	112.0	144.1	26.5
	B	0.0	0.0	0.0	0.0	0.0	0.0	40.0	71.1
	C	67.9	7.2	2.3	0.8	33.8	13.1	122.1	289.0
	D	640.5	21.0	21.7	6.2	100.2	76.3	614.0	641.2
7	A	230.9	99.7	28.4	0.0	159.6	112.0	78.0	0.0
	B	0.0	0.0	2.3	0.0	2.3	0.0	0.0	0.0
	C	61.0	7.0	1.6	0.5	30.8	12.5	134.4	319.0
	D	664.6	60.8	23.6	6.5	104.4	76.8	707.8	709.0
7a	A	251.5	105.2	28.3	0.0	159.6	112.0	104.7	11.1
	B	0.0	0.0	2.3	0.0	2.3	0.0	27.7	0.0
	C	51.9	8.7	3.2	1.0	34.7	142.6	121.3	311.4
	D	633.1	53.0	22.0	6.0	100.4	75.1	666.6	705.4
7b	A	251.1	125.7	42.8	1.0	152.1	112.0	138.7	42.2
	B	0.0	0.0	0.0	0.0	9.8	0.0	27.7	0.00
	C	70.0	14.0	2.6	0.8	30.3	13.9	152.7	310.9
	D	635.4	27.3	10.4	0.0	104.9	75.5	601.1	674.7
8	A	235.1	128.2	30.7	0.6	149.8	112.0	123.9	0.0
	B	0.0	0.0	2.3	0.0	9.8	0.0	39.4	100.3
	C	0.0	0.0	0.0	0.0	28.9	5.6	139.4	278.7
	D	721.4	38.8	28.9	6.4	108.6	83.7	617.5	648.9
9	A	238.5	99.1	28.4	0.0	159.6	112.0	85.5	0.0
	B	0.0	0.0	2.3	0.0	2.3	0.0	40.0	74.2
	C	68.7	12.9	3.4	0.9	29.5	14.6	204.5	315.1
	D	649.3	54.9	21.8	6.1	105.7	74.7	590.2	638.5
10(PA)	A	231.0	99.0	28.0	0.0	163.0	112.0	185.0	9.0
	B	0.0	0.0	2.0	0.0	2.0	0.0	19.0	99.0
	C	89.0	22.0	9.0	4.0	30.0	15.0	262.0	293.0
	D	637.0	46.0	16.0	2.0	105.0	75.0	590.0	635.0

longer needed for the management of oil and gas, the majority of these roads will be completely removed and the area rehabilitated. A small portion of these roads will be retained as system roads.

In total, the planned first decade road building ranges from a yearly high of 89 miles built in Alternative 6a to a low of 32 miles per year in Alternative 1. The Preferred Alternative 10 has a planned first decade road building program of approximately 79 miles per year. Approximately 74 of the 79 miles of road built per year in the first decade for the Preferred Alternative would be built to manage the oil and gas resource on the Forest.

13. Fire Management

Fire management strategies vary little by alternative, although activities such as timber harvest and oil development can have an effect upon the likelihood of fire occurrence. Fire management prescriptions have been evaluated for application in the Absaroka-Beartooth Wilderness and will be implemented in conjunction with the Forest Plan. Cooperative fire management agreements are continuing with various grazing associations and counties, in addition to the fire management efforts with the Forest's administration.

14. Energy Consumption

Energy consumption for each alternative was ascertained by multiplying Regional coefficients of energy use for various activities within an alternative. The factors that were used are shown in Table II-11, Energy Consumption by Activity. The major consumer of energy on the Forest is the oil and gas development activities, using both gasoline and diesel fuel. Timber management is also a comparatively high user of energy, considering the amount of timber that is harvested due to the long average haul distances. Energy use in dispersed and developed recreation factors varied by RVD use, and included energy expended by the user from home to recreation area or site.

15. Issues Considered in Alternatives

The alternatives were designed to respond in various ways to five major issues and a number of management concerns. Table II-12 shows the change in selected resources that indicate the responsiveness to issues, as compared to a 1980 baseline. Figure II-17 graphically displays these changes as percentages.

TABLE II-11
DECADE 1 ANNUAL ENERGY CONSUMPTION BY ACTIVITY

	ALTERNATIVE/BENCHMARK (OUTPUTS ARE AVERAGE ANNUAL)																MAX	MIN
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PNV	LVL
Developed Recreation (Millions of gallons of gasoline)																		
Decade 1	.94	1.12	1.12	1.04	1.14	1.14	1.11	1.14	1.11	1.11	.95	1.11	1.04	1.05	.91	1.10	1.09	.90
Dispersed Recreation (Millions of gallons of gasoline)																		
Decade 1	.39	.44	.44	.42	.45	.45	.44	.45	.44	.44	.39	.44	.42	.42	.37	.44	.43	.37
Grazing Management (Gallons of gasoline)																		
Decade 1	792	902	885	887	897	896	896	897	893	899	899	907	906	906	877	893	882	0
Oil and Gas Development (Thousands of gallons of gasoline)																		
Decade 1	407	536	541	504	516	518	493	511	527	522	513	536	534	520	219	527	568	2
Oil and Gas Development (Thousands of gallons of diesel)																		
Decade 1	2706	3563	3593	3352	3427	3443	3277	3398	3503	3473	3413	3563	3548	3458	1458	3503	3773	15
Oil and Gas Development (Millions of kilowatt hours of electricity)																		
Decade 1	15.5	20.3	20.6	19.2	19.6	19.7	18.7	19.4	20.0	19.9	19.5	20.4	20.3	19.8	8.3	20.0	21.6	0
Felling and Bucking (Thousands of gallons of gasoline)																		
Decade 1	17.3	.2	.9	.6	.7	.7	.7	.7	.5	.8	.8	13.6	.8	.8	.2	.5	0	0
Timber Yarding (Thousands of gallons of diesel)																		
Decade 1	259.5	3.3	14.0	9.8	10.5	10.2	10.0	10.5	7.4	12.3	12.1	20.4	12.9	12.7	3.0	7.3	0	0
Timber Loading (Thousands of gallons of diesel)																		
Decade 1	259.5	3.3	14.0	9.8	10.5	10.2	10.0	10.5	7.4	12.3	12.1	20.4	12.9	12.7	3.0	7.3	0	0
Timber Hauling (Thousands of gallons of diesel)																		
Decade 1	1107	14.1	59.5	41.6	44.8	43.5	42.9	44.8	31.3	52.5	51.8	870	55.0	54.4	12.8	31.4	0	0
Road Construction (Thousands of gallons of diesel)																		
Decade 1	244	603	616	215	428	492	478	485	600	608	597	625	613	597	429	600	596	0
Total Forest average annual energy consumption (billions of BTU's)																		
Decade 1	909	907	930	815	875	886	851	877	905	905	867	1092	908	891	481	904	942	162

FIGURE II-15

MILES OF ROADS NEEDED FOR MANAGEMENT

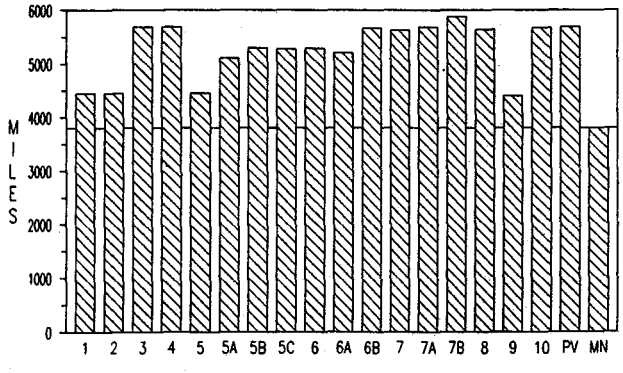
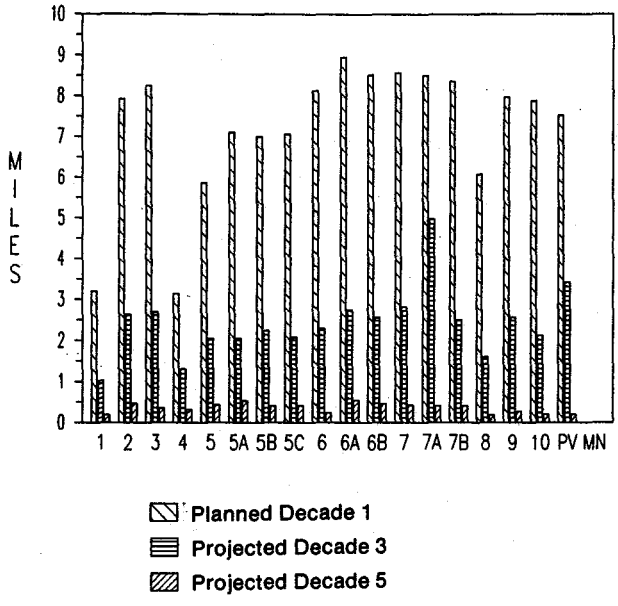


FIGURE II-16

NEW ROAD CONSTRUCTION PER YEAR



Total miles of road needed varies from a high of 5,685 miles in Alternatives 2 and 7 to a low of 4,400 in Alternative 8 (Current Direction). The Preferred Alternative 10 requires 5,650 miles of road.

Figure II-16 displays the miles of new road to be built per year planned in decade 1 with projections shown for decade 3. As discussed previously, decade figure are numbers that are planned to the first decade if an alternative is selected as the management plan for the Forest. Outyear figures (decades 2-7) are projected to occur in those time periods if an alternative was to continue to serve as the Forest Plan through those decades. The Forest Plan will guide management of the Forest for the next 10 to 15 years unless conditions or demands significantly change. At that time, a new analysis will be conducted and the Forest Plan may be revised or changed completely. So although long-range effects have been projected, the Plan is only valid until it is revised, committing the forest to a course of action for no longer than 15 years.

a. Road Construction and Management For Timber

Table II-21 at the end of this Chapter displays the amount of new road construction by alternative needed for timber management purposes. These roads are of two kinds; systems roads which are major planned arterial and collectors, and local or non-system roads which are roads built within timber sales. Planned first decade road building for timber management purposes ranges from a yearly high of approximately 15 miles in Alternative 6a to a low of 4.0 miles per year in Alternative 2. The Preferred Alternative 10 has a planned first decade road building program of approximately 5.0 miles per year.

The management of these roads built for timber management purposes would be similar for all alternatives. In all alternatives the local or non-system roads built would be closed when individual timber sales were finished. Some of the arterial and collector roads would remain open or closed seasonally to provide access for management activities such as fire control, recreation, and future timber harvest. The remainder of these roads would be closed seasonally or permanently to mitigate effects on wildlife or for other resource considerations.

b. Road Construction and Management For Oil and Gas

Table II-21 at the end of this Chapter displays the amount of new road construction by alternative needed for mineral management (oil and gas) purposes. Planned first decade road building for oil and gas ranges from a yearly high of approximately 75 miles in several alternatives to a low of approximately 26 miles per year in Alternatives 1 and 4. The Preferred Alternative 10 has a planned first decade road building program for oil and gas of approximately 74 miles per year.

The management of these roads would be very similar under all alternatives. As previously discussed, most of these roads are constructed under Special Use Permits to the leaseholders and are considered as private roads. When no

TABLE II-12
RELATIVE CHANGE BY ALTERNATIVE FOR SELECTED OUTPUTS
(PERCENT CHANGE FROM ALTERNATIVE 8)
(BASED ON 1ST DECADE VALUES)

	SELECTED ALTERNATIVES									
	1	2	3	4	5	6	7	8	9	10
Developed Recreation										
RVD's	400	442	450	427	462	448	439	368	449	433
% Change	+9	+20	+22	+16	+26	+22	+19	0	+22	+18
Dispersed Recreation										
RVD's	530	555	566	456	575	564	551	481	565	551
% Change	+10	+15	+18	-5	+20	+17	+15	0	+17	+15
Livestock										
AUM's	827	902	887	887	896	894	906	878	893	865
% Change	-6	+3	+1	+1	+2	+2	+3	0	+2	-1
Timber										
MMBF	3.5	2.2	4.4	3.4	4.1	4.0	6.0	4.0	3.1	3.0
% Change	-12	-45	+10	-15	+3	0	+50	0	-22	-25
Elk										
PC	1058	826	680	845	835	966	677	1042	845	972
% Change	+2	-21	-35	-19	-20	-7	-35	0	-19	-7
Deer										
PC	30	23	24	26	24	25	22	26	24	28
% Change	+15	-12	-8	0	-8	-4	-15	0	-8	+8
Oil Production										
MBBLS	13504	15664	15667	14586	15212	15451	15647	8203	15454	14552
% Change	+65	+91	+91	+78	+85	+88	+91	0	+88	+77
Present Net Value										
MM$'s	3641	4000	4120	3798	4001	4037	4058	2220	4042	3806
% Change	+64	+80	+86	+71	+80	+82	+83	0	+82	+71

16. Economic and Social Impacts on the Regional Area

Summary of Changes Between the Draft and Final EIS

This is a new section which discusses the economic and social impacts of the Forest on the regional area. Much of the material in this section was presented in Chapter 2 of the DEIS in the sections discussing Economic Impacts and Social Impacts. There has been an expansion of some of the presentations to clarify outputs and impacts.

a. Economic Impacts in the Forests' Direct area of Influence

The Custer National Forest has a wide economic and social zone of influence, extending into four states, (Montana, Wyoming, North Dakota, and South Dakota). Within these states, the activities on the Forest have the potential to directly impact 19 counties, indirectly 50 counties. See Appendix B for listing.

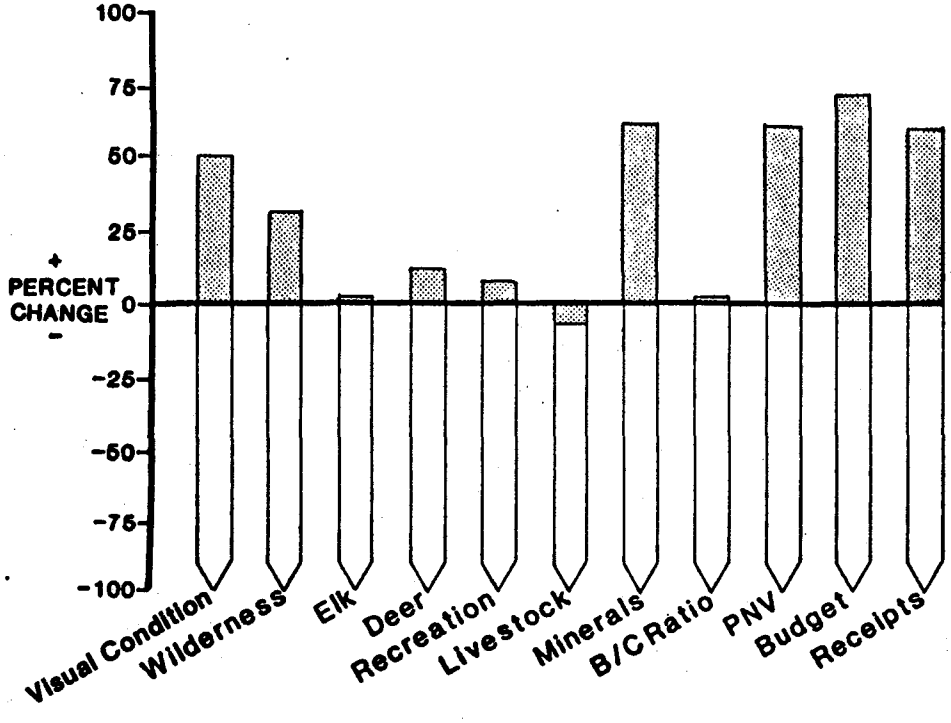
Changes in oil production, livestock grazing, recreation use, timber harvest, and Forest Service expenditures result in changes in personal income and employment in this zone of influence. Forest activities in 1980 accounted for 4,202 jobs and $162 million in personal income, or about 3 percent of the all economic activity in the zone of influence. The changes to employment and income, as additions or subtractions to the 1980 base year figures, by alternative are displayed in Figure II-18 and II-19.

Differences among alternatives in employment and income are primarily due to changes in mineral outputs, livestock grazing, recreation use, timber harvest, and Forest expenditures. The employment and income values include direct, indirect, and induced effects. The mineral related employment and income are computed for each alternative even though energy related benefits and costs are difficult to anticipate due to complex political factors, potential new technology or discoveries, and other substitutes for traditional carbon-based fuels. It would appear that the search for energy sources on public lands is likely to continue at least until the turn of the century.

As emphasis is placed on these market commodities as in Alternatives 2, 3, 7, 7a, 7b, and Benchmark PNV (which maximizes Present Net Value), income and employment increase. However, reduced employment and income would result in some of the recreation businesses. In the non-market emphasis, as shown by Alternatives 1 and 4, income and employment levels are generally reduced. However, some recreational businesses would expand simply because there are more recreation opportunities in these alternatives. The overall impact of the alternatives on recreation jobs is slight since some types of recreation

FIGURE II-17
PERCENT CHANGE IN MONITORED OUTPUTS

Comparison of Alternative 1 to Alternative 8 (Current Management)
% Change in Decade 1 Outputs



Comparison of Alternative 2 to Alternative 8 (Current Management)
% Change in Decade 1 Outputs

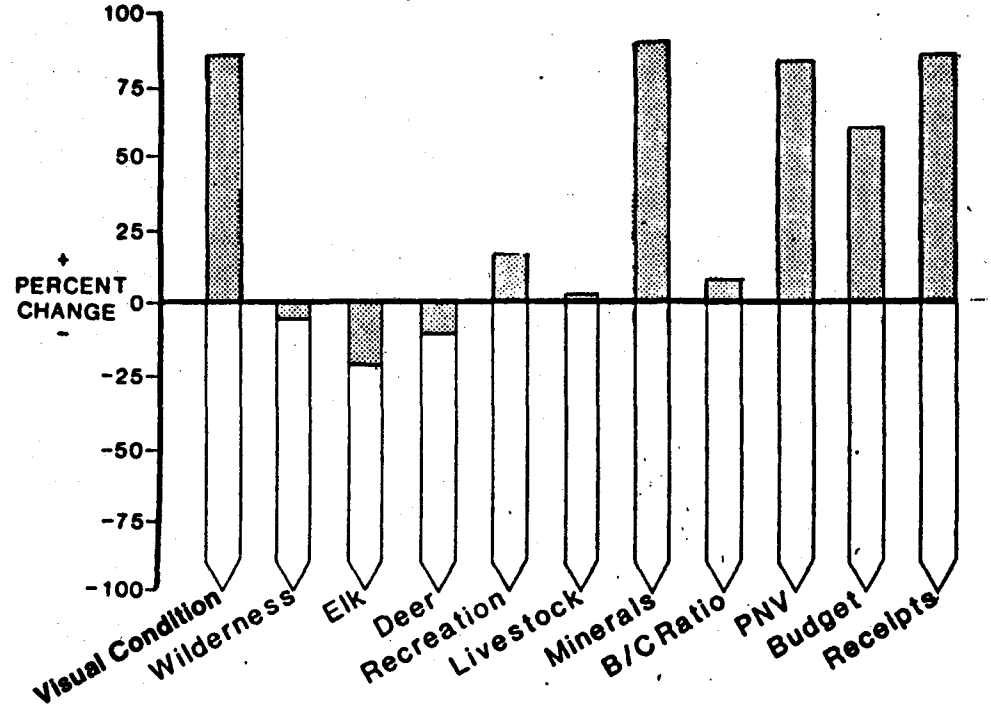
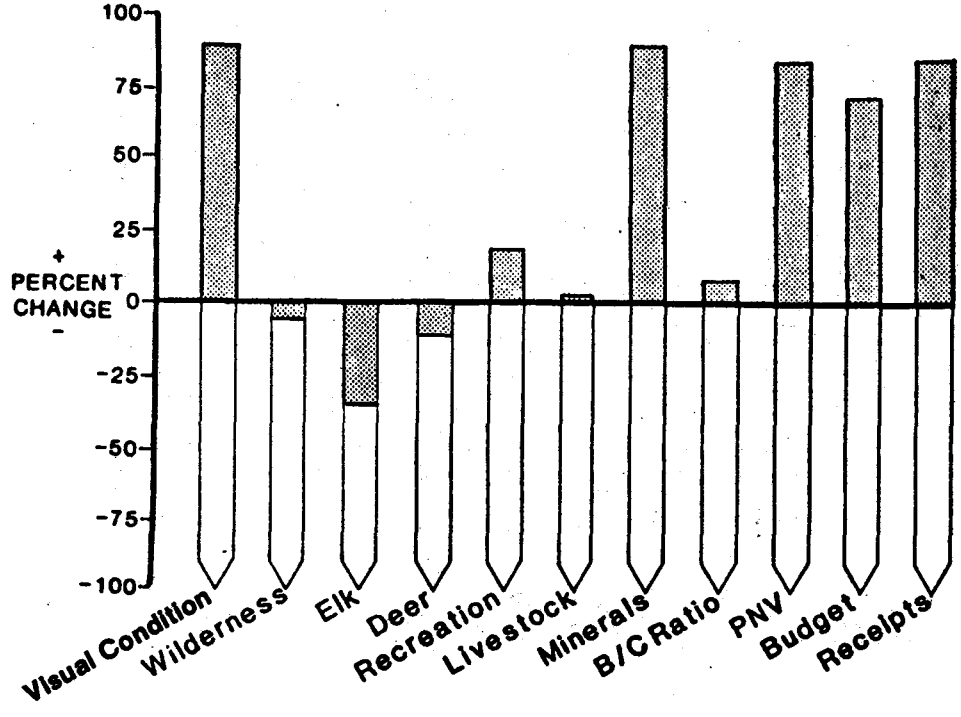


FIGURE II-17 (Continued)
PERCENT CHANGE IN MONITORED OUTPUTS

Comparison of Alternative 3 to Alternative 8 (Current Management)
% Change in Decade 1 Outputs



Comparison of Alternative 4 to Alternative 8 (Current Management)
% Change in Decade 1 Outputs

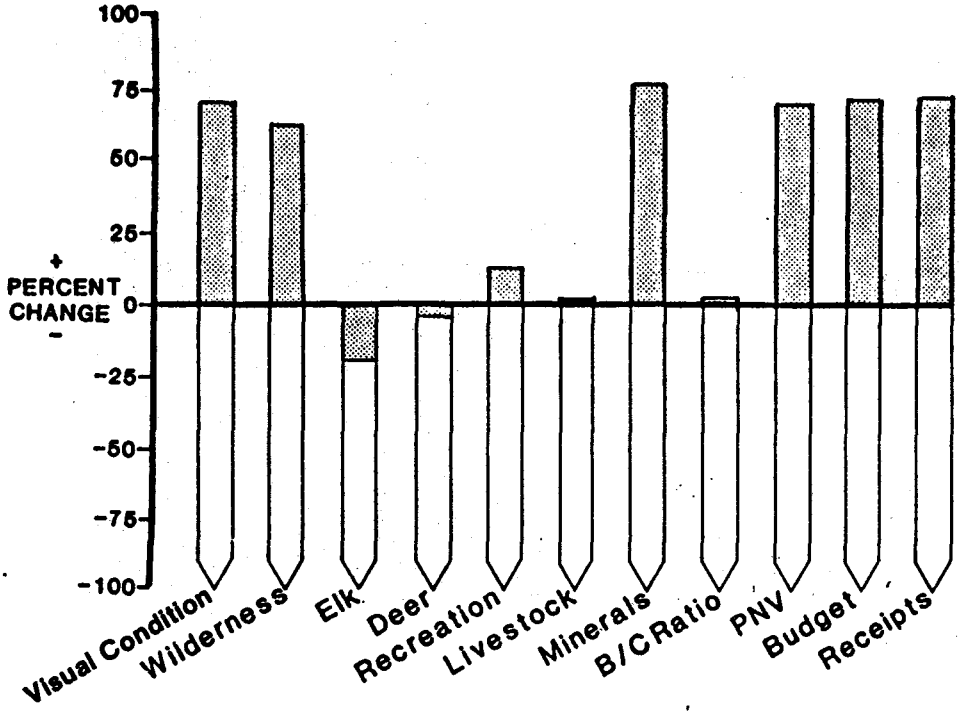
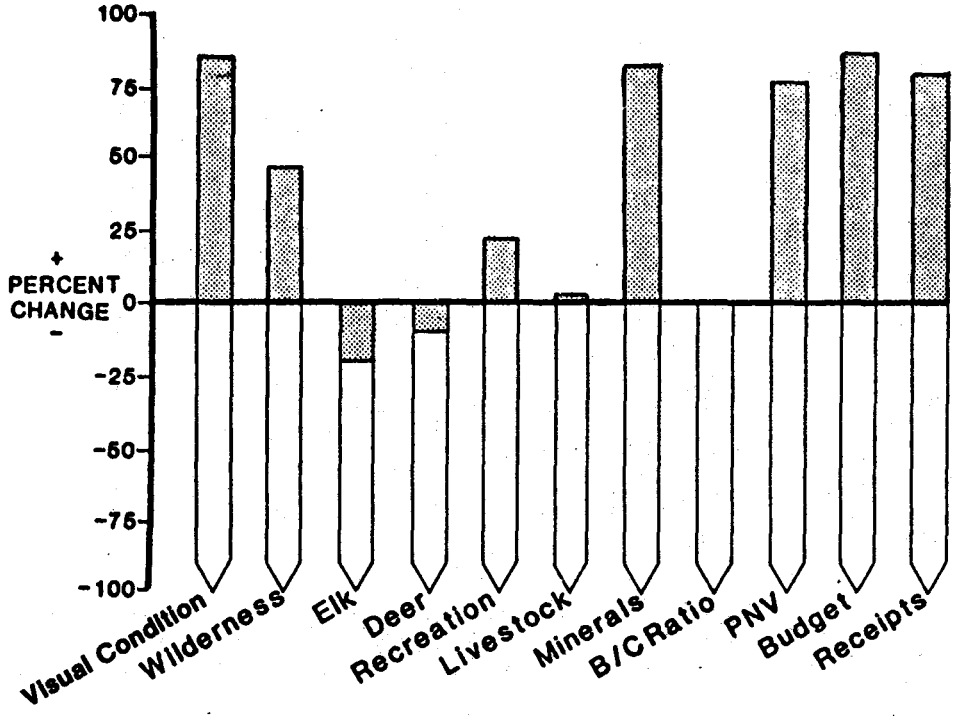


FIGURE II-17 (Continued)
PERCENT CHANGE IN MONITORED OUTPUTS

Comparison of Alternative 5a to Alternative 8 (Current Management)
% Change in Decade 1 Outputs



Comparison of Alternative 5b to Alternative 8 (Current Management)
% Change in Decade 1 Outputs

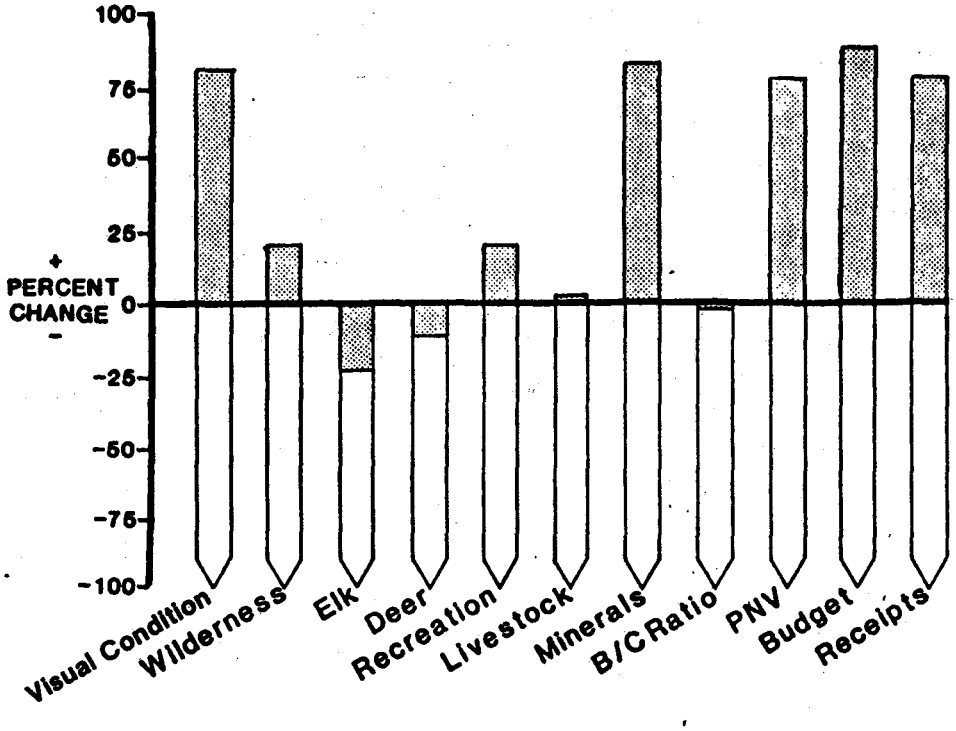
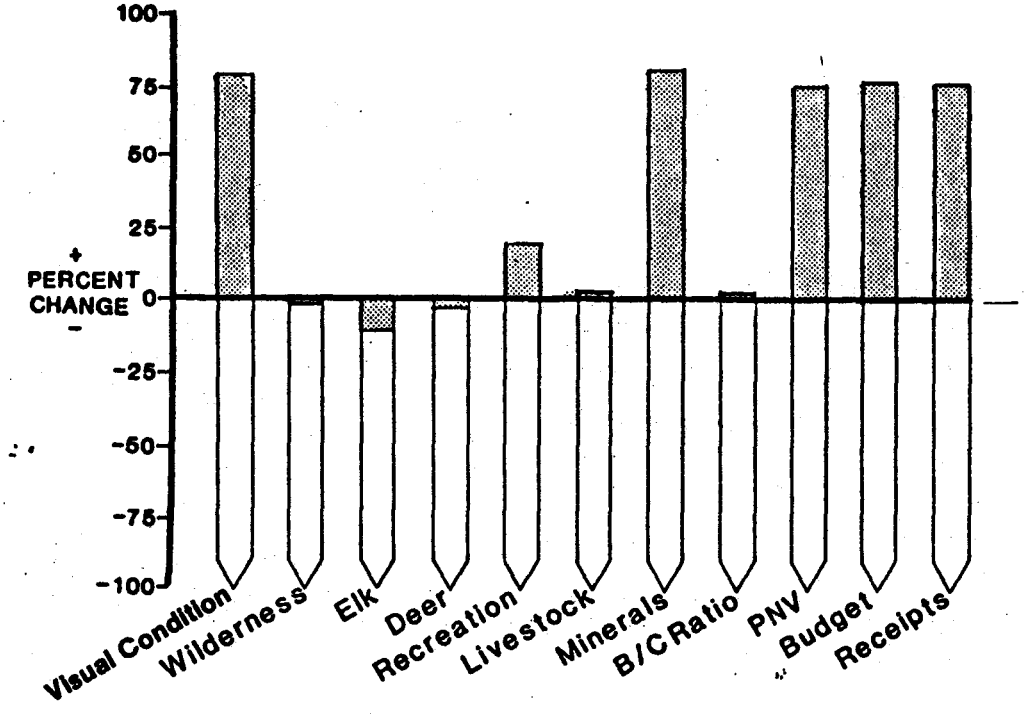


FIGURE II-17 (Continued)
PERCENT CHANGE IN MONITORED OUTPUTS

Comparison of Alternative 5c to Alternative 8 (Current Management)
% Change in Decade 1 Outputs



Comparison of Alternative 6 to Alternative 8 (Current Management)
% Change in Decade 1 Outputs

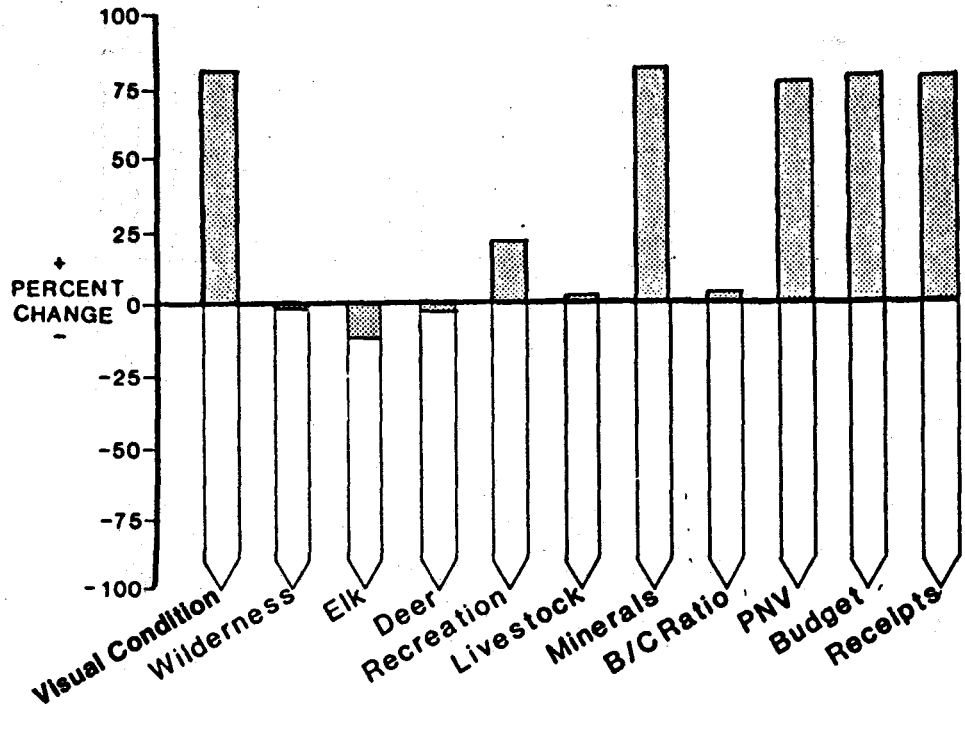
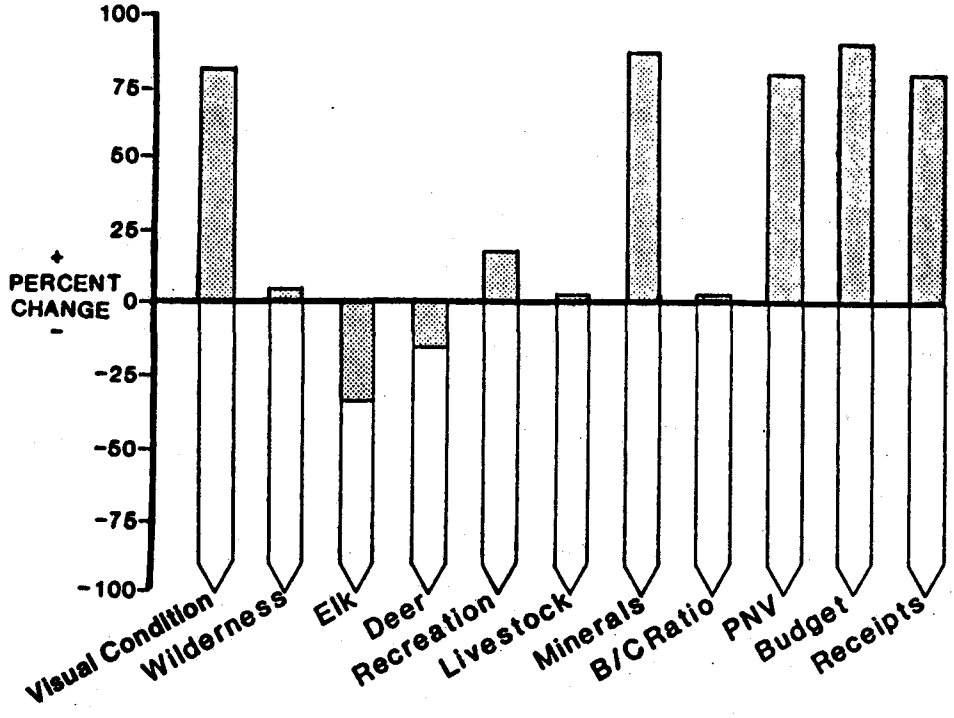


FIGURE II-17 (Continued)
PERCENT CHANGE IN MONITORED OUTPUTS

Comparison of Alternative 6a to Alternative 8 (Current Management)
% Change in Decade 1 Outputs



Comparison of Alternative 6b to Alternative 8 (Current Management)
% Change in Decade 1 Outputs

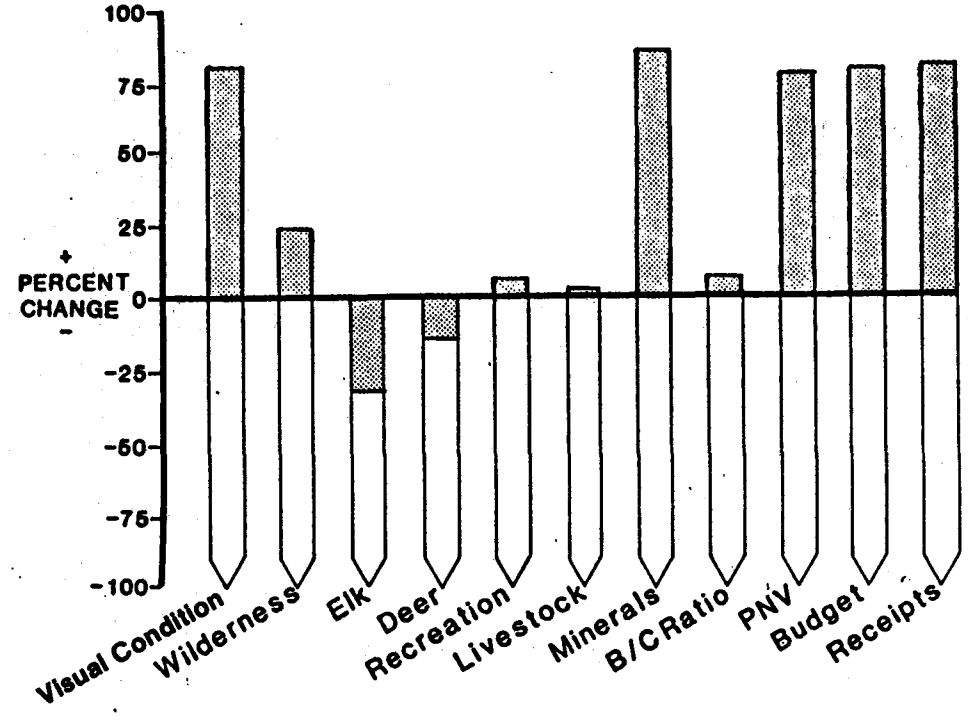
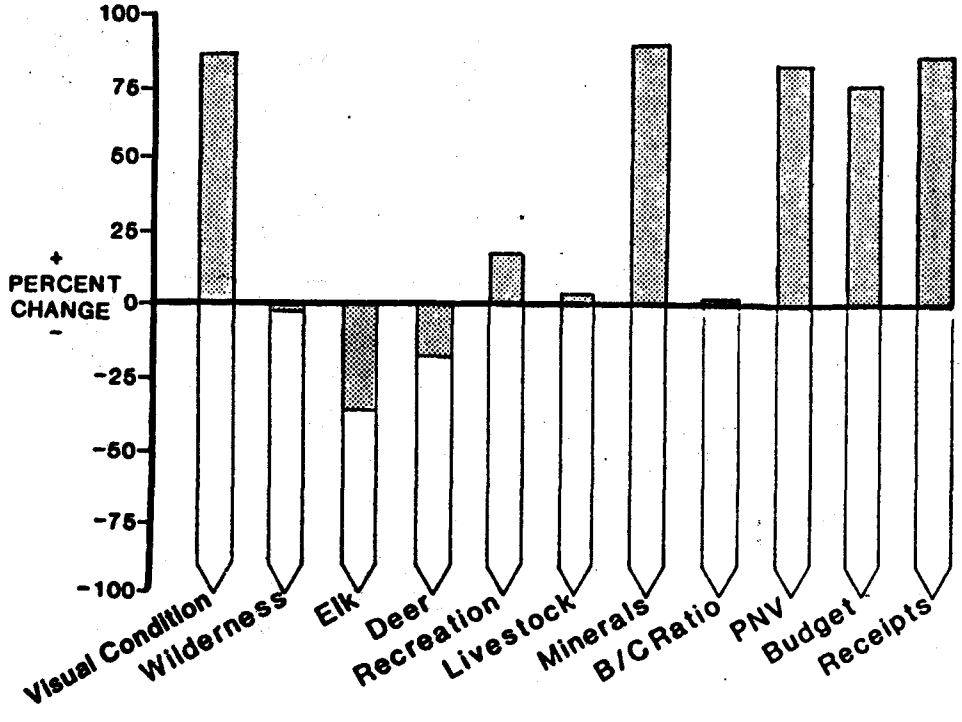


FIGURE II-17 (Continued)
PERCENT CHANGE IN MONITORED OUTPUTS

Comparison of Alternative 7 to Alternative 8 (Current Management)
% Change in Decade 1 Outputs



Comparison of Alternative 7a to Alternative 8 (Current Management)
% Change in Decade 1 Outputs

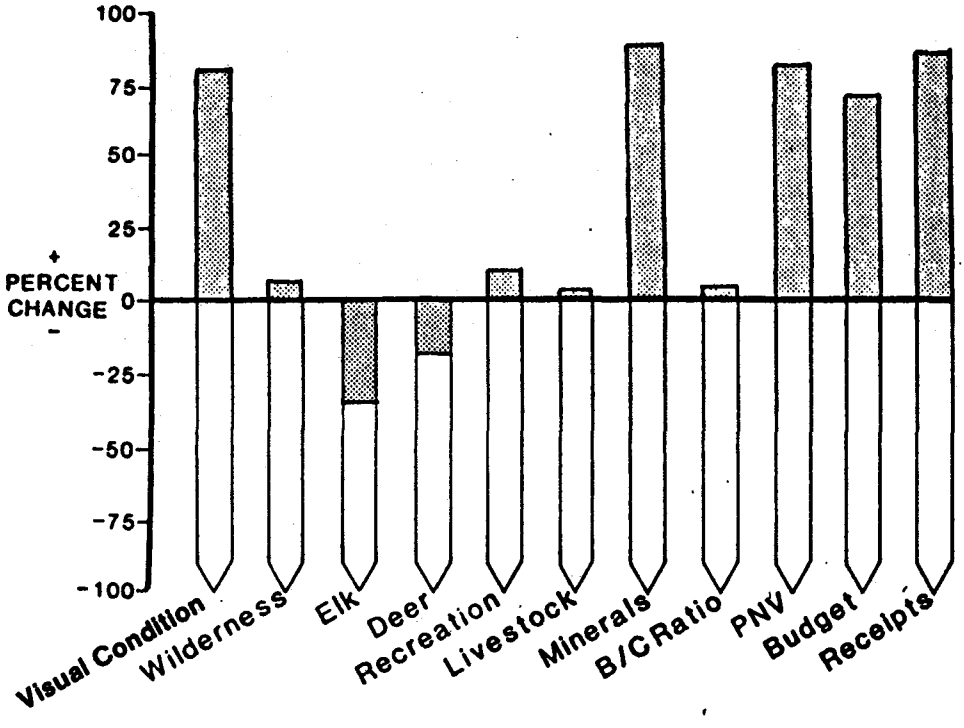
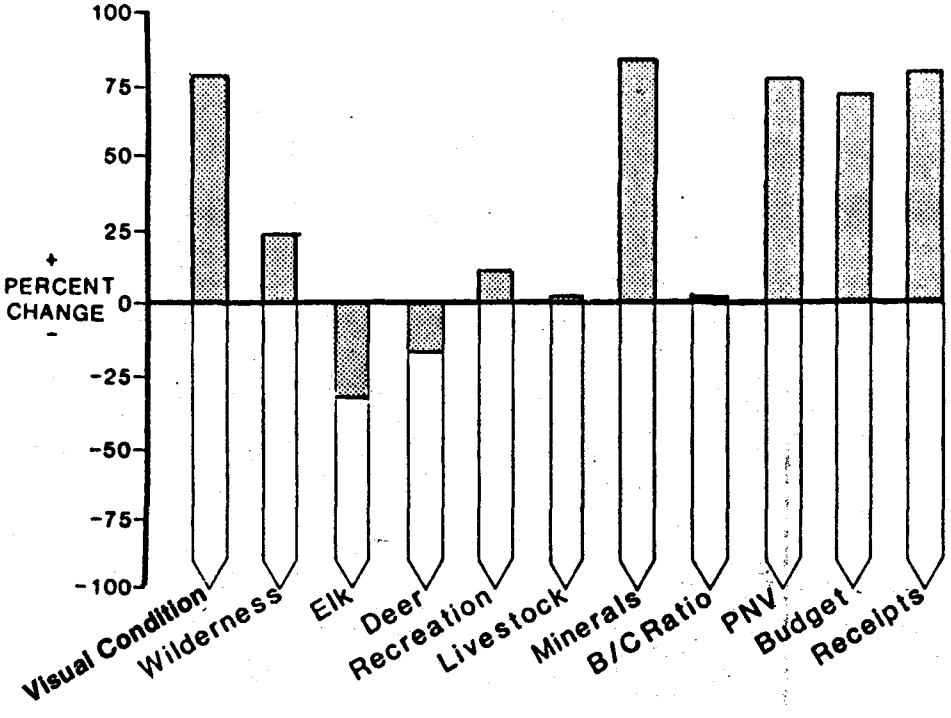


FIGURE II-17 (Continued)
PERCENT CHANGE IN MONITORED OUTPUTS

Comparison of Alternative 7b to Alternative 8 (Current Management)
% Change in Decade 1 Outputs



Comparison of Alternative 9 to Alternative 8 (Current Management)
% Change in Decade 1 Outputs

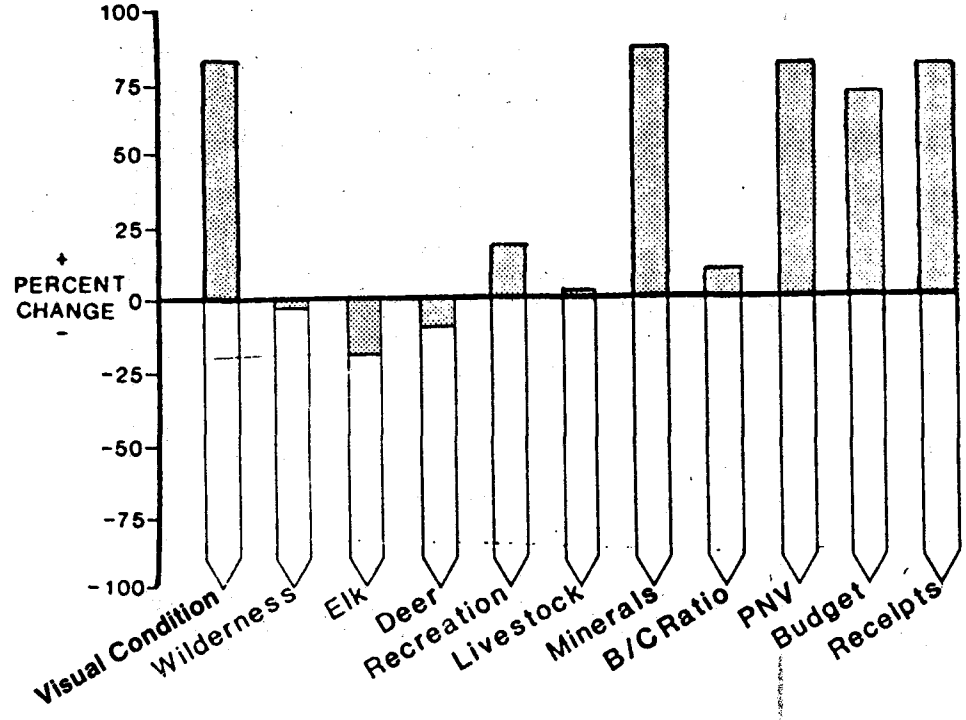


FIGURE II-17 (Continued)
PERCENT CHANGE IN MONITORED OUTPUTS

Comparison of Alternative 10 to Alternative 8 (Current Management)
% Change in Decade 1 Outputs

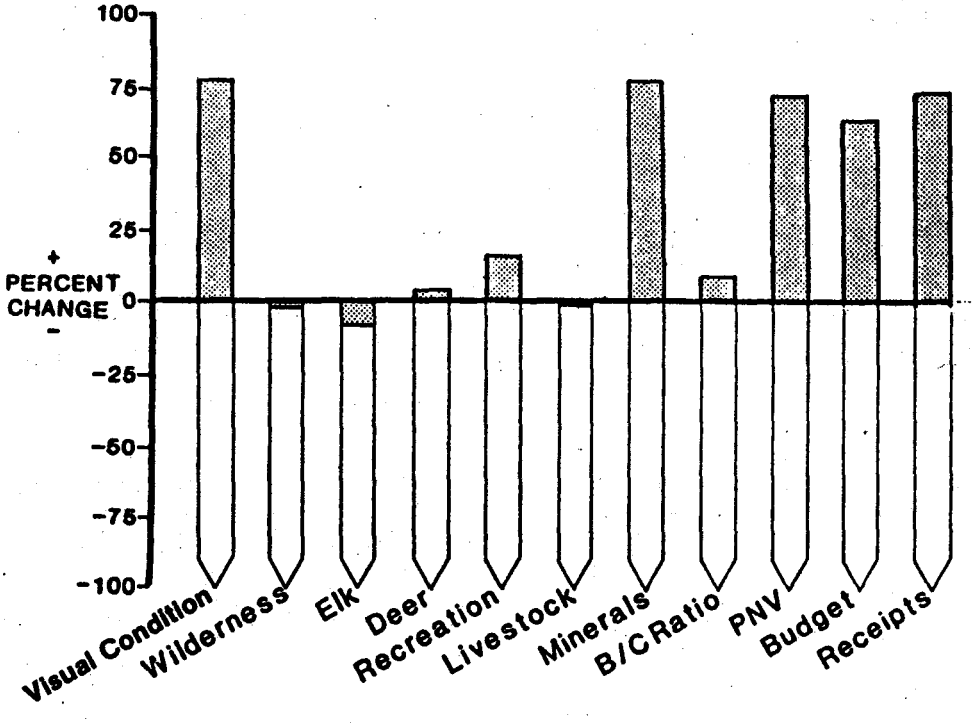


FIGURE II-18

PRIVATE SECTOR JOBS CREATED

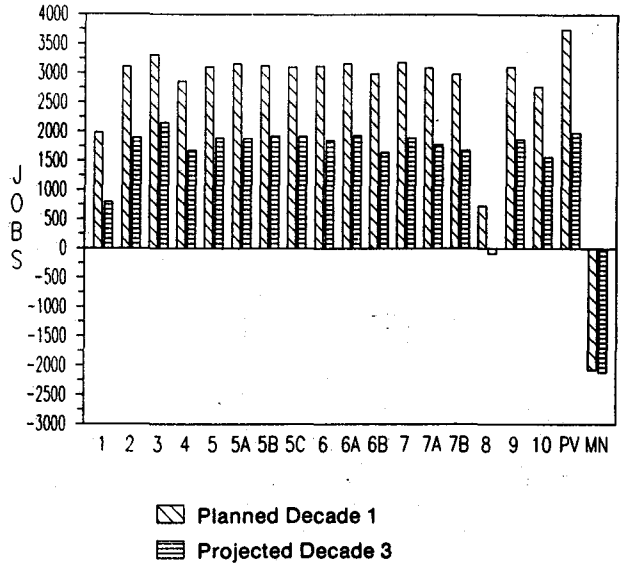
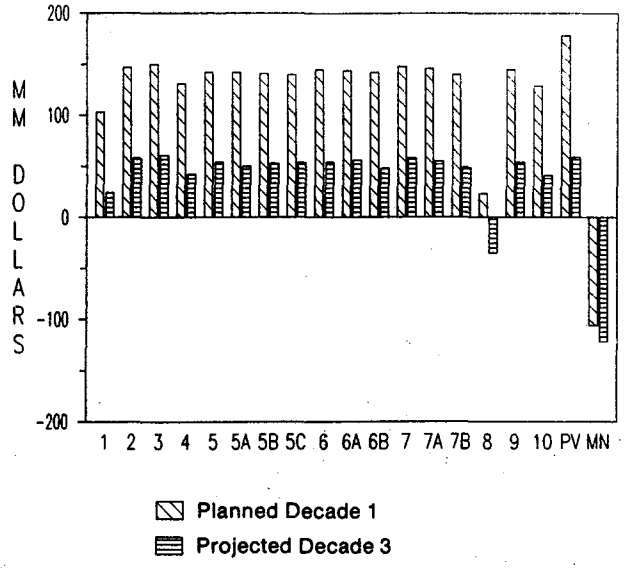


FIGURE II-19

PRIVATE SECTOR INCOME GENERATED



need the roads associated with the market emphasis alternatives. As the alternative emphasis changes, there is some degree of tradeoff between these different types of recreation jobs. The alternatives maintain varying levels and mixes of employment opportunities. Alternative 8 and Minimum Level Benchmark (which examines the minimum level of expenditure to only protect basic resources) indicate the effects that a reduced Forest budget would have on income and employment.

Impacts to employment opportunities for civil rights groups such as, women, minorities, Native Americans, handicapped, and socially disadvantaged vary by alternative. Employment opportunities, both in the number of jobs provided and the kinds of jobs available, are indicators of potential effects (State of Montana, 1984). In general, civil rights groups have not reached parity within the higher paying jobs. Basic manufacturing industries utilizing timber and minerals generally have proportionately higher paying jobs than agriculture and small business. Opportunities that expand the manufacturing sectors and create jobs offer more opportunity for women and minorities to be hired and advance in employment.

Alternative 3 provided the most jobs in the zone of influence, and all alternatives, except Alternative 8 in the second decade, provide more jobs than the 1980 level. These alternatives have the potential to provide greater employment opportunities for minorities who generally have higher unemployment rates than the rest of the population. Market-oriented alternatives, such as 2, 7, 7a, and 7b, provide for expanded employment and higher income levels in minerals, ranching, and wood products sectors.

Family operations (women as partners) are prevalent in the ranching and some recreation-oriented businesses. The extent to which these resources are emphasized in an alternative could create an impact to these businesses. Most alternatives maintain the current level of range forage which would indicate a stable situation for the ranching operation.

Total private sector jobs related to the Custer National Forest programs and outputs in the second decade are projected to range from a low of 4,113 in Alternative 8 (Current Direction) to a high of 8,612 in Alternative 3. The Preferred Alternative 10 is projected to provide 5,768 jobs in decade 2. For comparison, it is estimated that the Custer Forest programs and outputs resulted in 4,202 jobs in the 1980 base year.

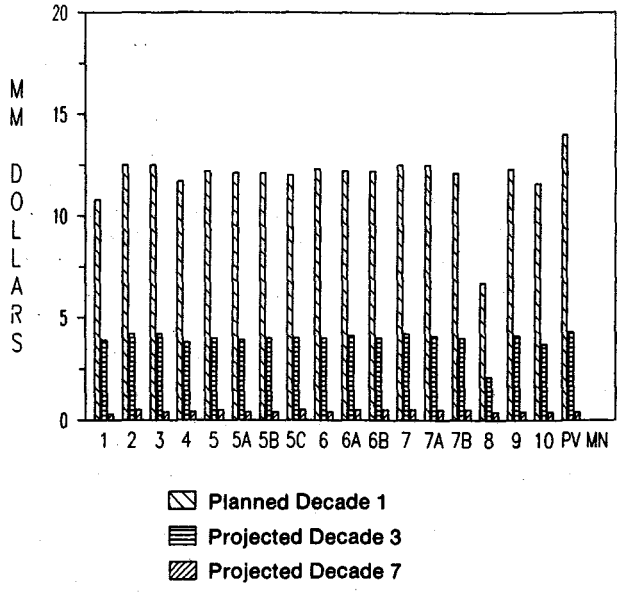
Projected second decade private sector income generated by National Forest programs and outputs varies from a low of 127 million dollars per year for Alternative 8, to a high of 312 million dollars in Alternative 3. The Preferred Alternative

10 is projected to produce 291 million dollars annually in private sector income. All income figures are in constant 1978 dollars.

A major impact to the local economy has been the returns to the local governments from Federal revenues. These revenues generated on the Forest are governed by many different legislative actions (reference Appendix B). Usually the returns to the states is based on a 25 percent of the Federal receipts, however, there are other Acts that require different amounts. The development of the petroleum industry has been a big boom to many of the counties in which Forest land exists. The payment to the counties from 1981 to 1985 have averaged about 8.8 million dollars. In 1985 a wind fall profit was declared that ran the total payment in excess of 13.5 million dollars. The majority of this revenue has been generated from the petroleum industry which has averaged 8.6 million. The trend of these payment since 1980 has been downward. Alternatives such as 2, 7, 7a, and 7b that support high commodity production will tend to increase the returns to the counties. The increase of wilderness reduced opportunities for petroleum development, but the decrease in returns was not significant. Amenity alternatives such as 1 and 4 reduced the the over all returns to the counties. The following table and figure show the expected returns to the counties by alternative. Table II-13 represents the present net value of the total returns over the planning horizon and Figure II-20 displays it by selected decades.

FIGURE II-20

RETURNS TO STATES



b. Social Impacts.

Employment and income levels are important factors in the quality of life, but they do not give the entire picture of the economic and social well being of local communities. In the rural settings of the Custer National Forest, an important part of the peoples' total satisfaction comes not only from jobs and income but from the natural and social environment. Forest polices and actions affect the quality of life, therefore it is important to look at the different alternatives and compare them with the current management to determine the likely results of implementing .

Six social variables — 1) sense of control and self-sufficiency, 2) feeling of certainty or uncertainty, 3) community cohesion and stability, 4) population change and feelings of crowding, 5) lifestyle and job dependence, and 6) symbolic meaning of the National Forest — are used to compare the effects generated by Forests outputs and activities on seven broad social groups (see Appendix B, section V). These groups have been identified as most likely to be affected by the different management objectives expressed by the alternatives. These groups are not mutually exclusive since people can belong to several groups. They are, however, categories useful for this analysis. Comparisons are made to the current situation represented by Alternative 8.

1) Ranchers/Farmers

Livestock producers, farmers and their families constitute approximately 25 percent or more of the population in the area. They tend to exert

TABLE II-13

PRESENT NET VALUE OF RETURNS TO STATES
(DISCOUNTED AT 4 PERCENT)
(VALUES IN MILLIONS OF 1978 DOLLARS)

Alt:	PNV	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10
PNV:	191	157	181	181	167	176	173	174	174	177	177	175	181	180	175	95	178	165

considerable influence as landowners and long-term residents. Many favor traditional land uses and preservation of the family farm or ranch. Ranching or farming is viewed as the essential industry upon which the area economy is based, and is a very desirable lifestyle that should not be jeopardized by short-term development. In the economy of today with high costs and unstable prices for livestock and crops, many ranchers and farmers have found it difficult to maintain their traditional lifestyle. Pressures to sell or subdivide have resulted in a feeling of uncertainty about maintaining the family farm or ranch. Although many of this group are dependent on forage from the National Forest to round out their livestock operations, they typically express a high degree of self-sufficiency or the ability to get along without any, or a minimum, of outside help.

For this group, alternatives which increase the amount of forage available for domestic livestock use or which reduce the costs of livestock management would be preferred. In addition, alternatives which provide the greatest amount of motorized access would be preferred. However, alternatives which greatly change the existing environment through extensive mineral development would not generally be supported because this could lead to changes in the ranching community's opportunities to maintain a traditional lifestyle. Increased population, higher land values, and changes in land use patterns are generally perceived as adverse impacts. Alternatives 2, 7, 7a, and 7b have the greatest potential for increasing forage production and would continue to support the industry. However, these alternatives would also emphasize the production of other commodity products such as oil and gas and would therefore conflict with traditional lifestyle values. Alternative 1 would least support the livestock industry in favor of amenity values. This could force some ranchers out of business or to find forage on other lands. The Preferred Alternative 10 would maintain livestock grazing at or near current levels but would place additional constraints on permitted grazing use through allotment management planning. These constraints are designed to protect riparian/woody draw areas and to maintain wildlife forage and cover on key habitats. Reducing these conflicts and managing for constraints without the overall loss of permitted grazing will require investments in range improvements, cooperation with livestock producers and grazing associations, and may increase costs of management for both the Forest and the livestock producers at least in the short term.

2) Loggers/Millworkers/Laborers

This group is a diverse one, with people of varied backgrounds working together. Generally, people in this category use National Forest resources, both as a source of employment and as a source of recreation, but the use tends to be more consumptive than contemplative. Employees of the timber and oil and gas industry are particularly interested in the use of these resources to maintain their position within the industries. The timber industry on the Forest is marginal, however, it supports several families in areas were the loss of the industry would have a significant effect on the local communities. Another industry that has come into the fore over the last decade is the petroleum industry. Industries such as oil and gas exploration and development can result in radical changes in the traditional lifestyles and economic conditions of the affected communities. Such a change has been experienced within the Custer National Forest zone of influence brought about by the oil boom in North Dakota. This brought economic stability through full employment, but the rapid change in the composition of the employment brought a degree of social instability.

Maintenance of certainty for this group encompasses maintenance of employment security and even increasing opportunities for employment. To this group, the Forest represents a source of resources that can be used and developed.

Alternatives such as 2, 6a, 7, 7a, 7b, 7c, that provide for a high level of timber harvest and mineral development would be favored by this group. Although alternatives 1 and 4 would provide many of the recreational opportunities desired by this group, these alternatives would be less desirable since these alternatives would tend to jeopardize employment potential within this group.

3) Retirees

Many of the people who live Red Lodge, and Billings, Montana have chosen to live in the area after retirement. This area provides many of the values desired by retirees such as shopping facilities, travel connections, and other community activities. However, within a relatively short driving time is the National Forest which provides a variety of recreational activities such as camping, picnicking, firewood, and just driving for pleasure. Generally, retirees prefer alternatives which stress maintaining the Forest in a natural setting, with adequate motorized access provided so that they can pursue the variety of recreation activities that are their primary use of the National Forest. They would also prefer alternatives that basically maintain the status quo. Drastic changes are viewed as a source of uncertainty in their lifestyle.

Alternatives 2 and 7 which fully promote commodity production to the detriment of amenity or recreational values would be less desirable to this segment of the population, while Alternatives 1 and 4 would be more favorable. They would see Alternatives 2 and 7 as a threat to community

cohesion and stability because of the potential shift in population with younger people moving in. Many retirees generally support additional wilderness designations. The wilderness issue has been one of the most volatile issues facing the National Forest. Designations of large acreages to wilderness, while perhaps agreeable to this segment of the population could be a source of conflict and disagreement within communities in the Forest's zone of influence because of the feeling of one group being favored over the interests of another group. Alternatives 2, 3, and 5 propose to keep essentially the same amount of wilderness as currently exists on the Forest. Alternatives 1, 4, 5a, 6b, 7b, would greatly increase the amount of wilderness on the Forest. The Preferred Alternative 10 would add one additional area to the National Wilderness System.

4) Professional

Generally, this segment of the population is relatively stable and would change little regardless of the management alternative implemented unless that alternative significantly lowered the production of key commodity resources such as livestock grazing and oil and gas production. Management of natural resources are generally approached from a "middle of the road" perspective. The members of this social group are generally interested in protection of resources but are not opposed to resource development so long as long-term resource values are protected and maintained for future generations. Members of this group are concerned that community cohesion be maintained or enhance and so would be supportive of alternatives that tried to provide adequate levels of resource use opportunities to meet the needs of the community. This group perceives the Forest to be a source of multiple resources, all of which needs to be managed and protected.

5) Younger Newcomers

This is a diverse social group that come to area for a variety of reasons. Many of the newcomers tend to relate strongly to and benefit from those alternatives which limit the activities related to resource development. In other words, alternatives such as 2, 6a, 7, 7a, 7b, and 7c that permit a high level of timber harvest, grazing activities, and mineral development are generally less desirable than alternatives such and 1 and 4 that preserve the natural setting of the National Forest and maintain as many option for the future as possible. This group is similar to other social groups in that they want to ensure the certainty of their future in the area. In addition, they generally want to ensure that the environmental factors that drew them to this area do not change significantly in the future, degrading the quality of their environment as they perceive it. In a similar vein, younger newcomers, attracted to the area because of the existing social environment and low population levels, are opposed to any alternatives for management that would lead to population increases resulting in a more crowded environment or to a lessening of community cohesion. If any people move into the area, the younger newcomers would like more people like themselves.

Some of the younger newcomers attracted to this area have come as a result of job availability associated with the oil and gas exploration and development. To this group the important consideration is job dependence and the feeling of certainty provided through long-term employment opportunities.

6) Business People

Generally, the business community believes that population increases and resulting increases in business depend upon increasing levels of commodity production that is long-term and stable. Alternatives such as 2, 6a, 7, 7a, 7b, and 7c would tend to be favored since these alternatives promote the production of livestock grazing, timber, and mineral exploration and development. The business community of Red Lodge, Montana would favor alternatives that provide for a high emphasis on recreation, at least on the Beartooth Ranger District. To this group community cohesion and stability is important. Population growth would be supported so long as a "boom and bust" situation did not occur. This group would support alternatives that promoted well planned, long-term gradual growth in the utilization of available natural resources.

7) Minority and Civil Right Groups

Portions of the Forest lie within the proximity of seven Indian Reservations. Native Americans are often interested in both the amenity resources and economic opportunities provided by the Forest. The protection of cultural resources associated with the various Native American Tribes are important to these groups, and alternatives that promote high commodity production are sometimes viewed as having the potential to destroy sites associated with Native American prehistory.

17. Net Public Benefits and Nonpriced Benefits Addressed by the Alternatives Considered

The overall conceptual measure of value of each of the alternative is net public benefit. Net public benefit is summarized here as a preface to discussing those benefits that cannot be expressed in economic terms.

Net public benefit is the overall long-term value to the nation of all outputs and positive effects (called benefits) less all associated Forest inputs and negative effects (called costs) resulting from management of the Custer National Forest. These costs and benefits are expressed in priced (PNV)

or non-priced terms (often subjectively measured). Many priced benefits and all financial costs of management can be measured in dollar terms. However, non-priced benefits and some negative effects cannot be measured quantitatively or cannot be fully valued in financial terms. A major goal of forest planning is to provide information that helps determine which alternative provides the mix of resources and use that most closely responds to issues, concerns, and opportunities while maximizing the net public benefit of managing the Forest. Net public benefit is maximized by the alternative which has the greatest excess of benefits over costs. The choice of the alternative that maximizes net public benefit is a subjective decision.

The principal benefits and costs relevant to making the decision for the Custer National Forest are associated with the issued discussed in Appendix A and with legislation underlying the Forest planning process. The benefits and costs are discussed below in the following sequence. First, those benefits that cannot be quantified (non-priced benefits) are discussed. Next, the discussion details those costs and benefits that can be measured in financial terms (significant differences in economic values among alternatives). Third, information is provided that describes the trade-offs between non-priced and priced benefits (major trade-offs among alternatives). Finally, there is a comparison of changes in economic benefits with differences in responses to the issues (economic trade-offs). Because these are summary statements, a fully informed judgment of the alternatives also requires an understanding of the results displayed elsewhere in this document.

The major non-priced benefits, described in detail in Appendix B, are summarized here. Non-priced benefits reflect issues that are not directly addressed by the alternative PNV comparisons. The resolution of these issues varies significantly by alternative and can be measured by physical indicators such as acres. An increase in non-priced outputs often results in a decrease in priced outputs (lower PNV). Table II-20 (Indicators of Responsiveness of Alternatives to Major Issues and Regional Concerns) in Section 19 shows tradeoffs between providing priced outputs and non-priced outputs. The indicators are used to estimate the relative achievement of non-priced resource goals among alternatives. The indicators do not fully quantify or place a value on the non-priced benefits but they indicate differences in levels of non-priced benefits between alternatives.

a. Non-Priced Benefits With Significant Differences Among Alternatives

Although there are several non-priced benefits resulting from Forest management, the following were identified as major benefits on the Custer National Forest.

1) Visual Quality

Visual quality refers to the range and distribution of the scenic aspects and perceived beauty and enjoyment of the forest environment. Differences among forest recreationists, nearby residents, and travelers in the enjoyment they would receive from the physical condition and appearances of the Forest varies by alternative but is difficult to measure. Visual quality concerns occur in particular where parts of the Forest are visible from major travel-ways, population centers, or recreation use sites. It is considered important to maintain some degree of natural, relatively undisturbed appearance in these major seen areas. Existing Visual Class 4: Disturbed was used to monitor or measure the management impacts by alternative to the visual resource. The measure of disturbance to the visual quality is indicated by the acres of EVC:4.

2) Wilderness and Roadless Designations

One of the values of the Custer National Forest is to provide some degree of high quality primitive and semi-primitive roadless recreation opportunities to the public, though it cannot be completely measured in dollars and cents. Although total RVD's are valued and modeled in FORPLAN, the PNV analysis is not designed to track primitive and semi-primitive RVD outputs, and it assigns only an average value while high quality recreational opportunities may in fact be worth more.

In addition, recreation use is only one value of the wilderness or roadless resource. Citizens at both the local and national level have expressed the desire to have more of these types of lands available. Many people feel other values of wilderness include such things as maintaining options for future generations, maintaining native plant and animal species, and providing a research base for studying a natural undisturbed environment. Quantifying the value of a wilderness or roadless area strictly by its RVD use misses many of its important values. The indicator for this recreational value is the total acres with a wilderness or roadless designation and an analysis of their relative size and distribution across the Forest.

3) Wildlife Habitat

Because of the wide diversity of wildlife that inhabit the Custer National Forest, many of the ecosystems and existing vegetative successional stages are considered very important wildlife habitat. The Forest supports many game and non-game species and may contain potential habitat for several Threatened and Endangered Species. Big game hunting is valued through FORPLAN and values associated with wildlife related RVD's. In addition to big game hunting, however, wildlife

habitat provides many other non-priced benefits. Big game hunting is a large component of the local lifestyles in addition to being an economic contributor to the states. Wildlife habitat contributes to maintaining species diversity, provides for research opportunities, adds to visual quality, improves the quality and value of hunting and other recreational activities, and provides benefits to some individuals simply due to the fact that habitat for game and non-game species exists. The indicators used to evaluate wildlife habitat are elk and deer potential capacity, and prairie grouse effective acres.

4) Local Employment and Community Stability

Most communities desire modest economic growth that can be managed without significant social disruptions or stress on existing institutions. Changes in employment and income, and payments to counties are indicators of the economic aspect of community well being. These indicators generally decrease or increase with changes in priced benefits, especially oil and gas.

5) Old Growth and Habitat Diversity

Maintaining some degree of old growth distributed across the timbered portions of the Forest is important both in maintaining habitat diversity and providing for old growth dependent wildlife species.

Indicators for this include both the amount of tentatively suitable timber lands that are not scheduled for regulated harvest by alternative and the total amount of old growth on tentatively suitable timber lands that are either in or out of the regulated timber base.

b. Non-Priced Benefits that Differ Less Among the Alternatives

1) Threatened and Endangered Species Habitat

Habitat for these legislatively protected species is provided at approximately the same level in all alternatives.

2) Firewood

The Forest considers firewood an important resource to the local publics. Although recent charge programs have done much to make providing firewood a paying proposition, the actual dollar costs and revenues do not completely represent the value of this output to the public.

All alternatives are expected to be able to satisfy the demand for firewood, though the ease of obtaining the product may vary considerably by alternative due to the number of miles of new road, miles of open road, and the level of timber harvest activities.

3) Water Quality and Quantity

Providing adequate quantities of clean water is important, especially to users of municipal watersheds such as Red Lodge, Montana. Clean water is obviously important in the maintenance and improvement of fisheries. The alternatives have been ranked as to their relative risk of producing sediment based on the factors of livestock grazing, road construction, timber harvest, and oil and gas production. However, the difference in the quantity and quality of the water produced is probably insignificant from one alternative to another.

18. Significant Differences In Economic Values Among Alternatives

This section explains differences that occur among the alternatives' priced benefits and outputs. Additional tradeoffs involving outputs and benefits not quantified in economic terms by PNV together with community effects and different responses to Forest issues are discussed in Section 19.

a. Differences in Present Net Value

The primary measure of economic efficiency (net priced benefits) is present net value (PNV). This is the sum of market and non-market priced values (timber sales, livestock grazing, mineral receipts, recreation, wildlife related recreation, special use fees, and other land uses) less all management costs for the 75 year planning horizon discounted at 4 percent. The maximum PNV Benchmark represents the maximum net return available from managing the Forest. Although it meets minimum legal requirements of managing the Forest, the PNV Benchmark is not designed to address Forest issues and management concerns.

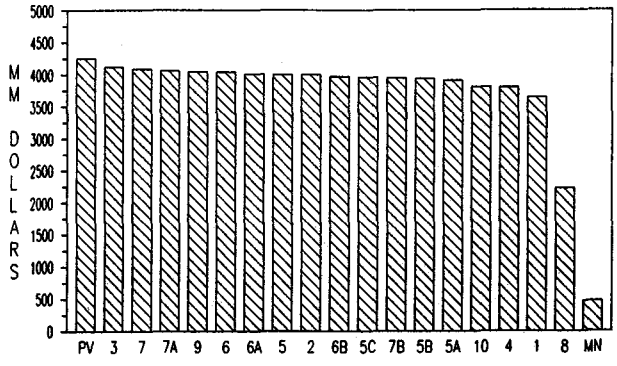
The alternatives are ranked by present net value in Figure II-21 and Table II-14. The maximum PNV Benchmark represent the maximum net economic return available from managing the Forest and is also included in the Table and Figure. This benchmark is provided as a reference point. The second column in Table II-14 shows the differences in PNV among pairs of alternatives. These figures are estimates of the net economic values that would be foregone if a lower-ranked alternative rather than the preceeding one were selected. Because mineral values are the major component of PNV, these potentially foregone values are largely due to limiting the minerals program. Also displayed in the table are discounted costs and benefits, and the differences in these values among pairs of alternatives.

A further breakdown of discounted benefits and costs by resource group is displayed in Table II-15. Again the alternatives are ranked by PNV.

Table II-15 shows that as minerals (oil and gas) benefits decline PNV also tends to go down. PNV declines primarily due to foregoing oil and gas production on some areas that would be managed to maintain their undeveloped characteris-

FIGURE II-21

PRESENT NET VALUE



tics. There are two exceptions to this general trend of lower oil and gas production resulting in lower PNV. Alternative 2 (RPA) has the second largest output of oil and gas yet it ranks only eighth among the alternatives in PNV. The reason for the lower PNV of Alternative 2 appears to be the somewhat higher range, recreation, and timber costs associated with the decline in oil and gas production. Another alternative does not follow the general trend is Alternative 7b. This alternative was designed to provide a high level of wilderness and roadless wile maintaining relatively high levels of commodity outputs. This requires intensive management on much of the land not designated to wilderness, including harvesting on more expensive lands which has a lower benefit cost ratio. Also range costs are high in this alternative in an attempt to increase forage production for domestic livestock.

Table II-15 shows that discounted timber benefits for the planning horizon are less than discounted timber costs in all alternatives which indicates that overall financial returns of the timber program are negative. However, the negative values do not mean that all sales will be below cost sales. Timber sales, whether below cost or not, were assessed in terms of how they fit into a comprehensive program of management for the Forest. The mix of outputs and the associated costs and benefits produced by the different alternatives are the result of selecting prescriptions which most efficiently meet the objectives of the alternatives. Cost efficiency was considered in both the development of prescriptions and in the selection of the prescriptions to be implemented in any alternative. The selection was through use of the FORPLAN model which had a range of prescriptions to choose from when determining an optimal solution for each alternative based on the constraints applied to the alternative and the objective of maximizing PNV. The maximum PNV Benchmark represents the most economically efficient mix of management prescriptions and resource outputs for the Forest (including timber).

In spite of alternative and prescription cost efficiency objectives, indications are that most sales on the Forest will be below cost sales. While efficient management and below cost sales are not

TABLE II-14

PRESENT NET VALUE, DISCOUNTED BENEFITS AND COSTS (DISCOUNTED AT 4%)
(ALL FIGURES IN MILLION $)

Alternative	PNV	Change from Previous Alternative	COSTS	Change for Previous Alternative	BENEFITS	Change from Previous Alternative
Max. PNV	4249	129	175	5	4424	-124
Alt 3	4120	20	180	1	4300	-18
Alt 2	4100	15	181	11	4282	-5
Alt 7	4085	25	192	-6	4277	-31
Alt 7a	4060	18	186	-11	4246	-29
Alt 9	4042	5	175	-2	4217	-7
Alt 6	4037	28	173	14	4210	-14
Alt 6a	4009	8	187	-12	4196	-18
Alt 5	4001	33	175	3	4178	-32
Alt 6b	3968	9	178	5	4146	-3
Alt 5c	3959	13	183	1	4143	-13
Alt 7b	3946	6	184	8	4130	2
Alt 5b	3940	20	192	-4	4132	-34
Alt 5a	3920	114	188	-23	4098	-126
Alt 10	3806	8	165	13	3972	4
Alt 4	3798	157	178	-7	3976	-164
Alt 1	3641	1421	171	-65	3812	-1485
Alt 8	2220	0	106	0	2327	0

TABLE II-15

PRESENT NET VALUE, DISCOUNTED BENEFITS AND COSTS BY RESOURCE GROUP
(MILLIONS OF DOLLARS—1978 DOLLARS)

		Discounted Benefits					Discounted Costs					
Altern/Bmrk	PNV	Minerals	Range	Wildlife	Recrea'n	Timber	Minerals	Range	Wildlife	Recrea'n	Timber	Other
Max PNV	4249	3857	271	190	97	8.2	6.5	49.2	7.4	14.7	10.3	86.7
3	4120	3718	271	205	98	8.0	6.1	49.0	8.0	15.2	14.9	87.0
7	4085	3711	288	174	96	7.7	6.0	57.9	6.6	14.9	18.8	87.7
7a	4060	3686	288	174	90	7.5	6.0	57.2	6.5	13.8	15.4	87.1
9 (Dep.)	4042	3673	275	195	97	6.6	5.9	50.0	7.6	13.8	10.5	87.1
6	4037	3639	275	195	97	3.8	5.9	49.8	7.3	13.1	9.9	86.8
6a	4009	3622	280	190	97	7.6	5.9	51.3	7.4	15.0	20.5	87.3
5	4001	3604	277	191	99	6.5	5.8	50.3	6.7	14.9	12.1	87.8
2 (RPA)	4000	3715	287	178	96	5.7	6.0	53.6	7.0	13.9	14.0	87.2
6b	3968	3587	280	188	84	7.2	5.7	51.5	7.4	12.4	15.2	86.2
5c	3959	3569	277	191	100	6.4	5.8	50.3	6.4	16.0	15.9	87.9
7b	3946	3571	288	173	91	7.4	5.8	57.6	8.1	13.7	14.3	86.6
5b	3940	3560	277	190	100	6.2	5.8	50.1	8.1	18.3	15.8	93.5
5a	3910	3524	277	189	101	7.3	5.8	49.7	8.0	17.9	14.0	92.5
10 (P.A.)	3806	3404	264	208	92	3.3	5.4	48.6	7.8	11.4	6.1	85.7
4	3798	3402	271	203	93	6.9	5.6	48.9	8.3	15.3	11.0	88.5
1	3641	3246	230	246	87	3.1	5.0	39.5	11.4	15.3	9.0	91.0
8 (C.M.)	2220	1818	258	170	76	3.9	2.3	35.9	1.7	2.0	7.7	56.8
MIN	222	244	0	181	74	0.0	0.0	0.0	0.0	0.4	0.0	32.5

Note: The direct comparison of individual resource benefits and costs is misleading because the individual resource cost information does not include General Administration and other nonseparable costs. These are included in the "Other" cost category.

incompatible (Schuster and Jones, 1985) it is the Forest's intent to avoid below cost sales whenever feasible. In implementing any alternative, further project level analysis will be required prior to implementing project activities. Regional Office direction requires that as part of the project level analysis a feasibility analysis of each timber sale over one million board feet will be made to assure it has been designed with the most cost effective measures possible in keeping with environmental concerns. This feasibility analysis will examine strategic items in the sale design process to assure consideration of economic impacts of these items on the sale value. In addition, a cash flow analysis of the sale will be done with then current market conditions. These and other requirement of this analysis have been added to the Forest Plan.

b. Receipts and Non-cash Benefits

The portion of the economic benefits which are actual returns to the U.S. Treasury are called receipts. Receipts are projected to decrease in all alternatives because mineral production declines after the fifth decade. Net receipts to the U.S. Treasury are the dollar returns to the treasury less the total budget costs.

Non-cash benefits are the difference between the potential cash values of resources (market and non-market priced benefits) and the fees actually paid by users of those resources (receipts). They are benefits to individual users who are charged no fees or who are charged fees that are less than full economic values. Non-cash benefits are relatively constant across all alternatives and all periods. Receipts, costs, market and non-market benefits are displayed in Table II-16.

Receipts in the first decade for all alternatives are higher than the 1980 average cash flow of $42.9 million. The annual cash flow by resource for decades 1, 3, 5, and 7 are displayed in the Major Data Table at the end of this chapter.

Net cash flow is the total values less the total costs and represents the cash flow to the U.S. Treasury. In all alternatives, cash flow exceeds costs until the fifth decade when the oil production decreases. The average annual returns to the U.S. Treasurey for all Alternatives for decades 1, 3, and 5 are shown in Figure II-22.

c. Budget

The average annual budget for the Custer Forest for decade 1 is displayed by alternative in Table II-17. The budget displayed is shown by cost categories: capital investment, and operation and maintenance. On this Forest, most capital investment costs are for road construction and range improvements. For a further discussion of these categories see Appendix B, Section IV. As is the normal case throughout this document, dollar figures are expressed in constant first quarter 1978 dollars, consistent with the 1980 RPA.

The average annual budget for the Forest varies from a ow of 4.5 million dollars in Alternative 8 (Current Management) to a high of 7.7 million dollars for the commodity oriented Alternative 5a, and 6a. A relatively constant part of costs in all

TABLE II-16

AVERAGE ANNUAL NET RECEIPTS TO THE U.S. TREASURY (MILLION DOLLARS)

Altern/Bench	Net Receipts		Total Cost		Total Receipts		Noncash Economic Benefits	
Decades:	1	5	1	5	1	5	1	5
Max. PNV	49.0	-4.1	6.9	8.4	55.9	4.3	208.6	83.8
2	43.1	-2.0	6.8	8.2	49.9	6.2	192.7	69.7
3	42.9	-1.8	7.1	7.8	50.0	6.0	198.8	72.0
7a	42.8	-1.8	7.1	8.2	49.9	6.4	202.5	76.0
7	42.7	-1.9	7.3	8.5	50.0	6.6	200.5	81.0
9	42.3	-1.3	7.0	7.3	49.3	6.0	193.4	65.2
6	42.2	-1.5	7.1	7.2	49.3	5.7	194.4	55.5
6b	41.6	-1.6	7.3	7.5	48.9	5.9	197.5	64.3
5	41.5	-1.9	7.1	7.7	48.6	5.8	193.1	63.3
7b	41.4	-2.0	7.1	8.2	48.5	6.2	196.9	76.2
6a	41.2	-1.8	7.7	7.8	48.9	6.0	202.8	69.9
5a	40.5	-2.6	7.6	8.0	48.4	5.4	199.4	61.5
5c	40.7	-2.0	7.4	7.8	48.1	5.8	197.6	63.3
5b	40.5	-2.5	7.7	8.2	48.2	5.7	198.5	63.2
10	39.8	-1.5	6.7	7.0	46.5	5.5	183.2	52.6
4	39.6	-2.1	7.1	7.7	46.7	5.6	184.9	66.2
1	36.1	-2.7	7.1	7.2	43.2	4.5	171.6	51.5
8	22.3	-1.1	4.5	4.3	26.8	3.2	115.2	39.4

FIGURE II-22

RETURNS TO U.S. TREASURY

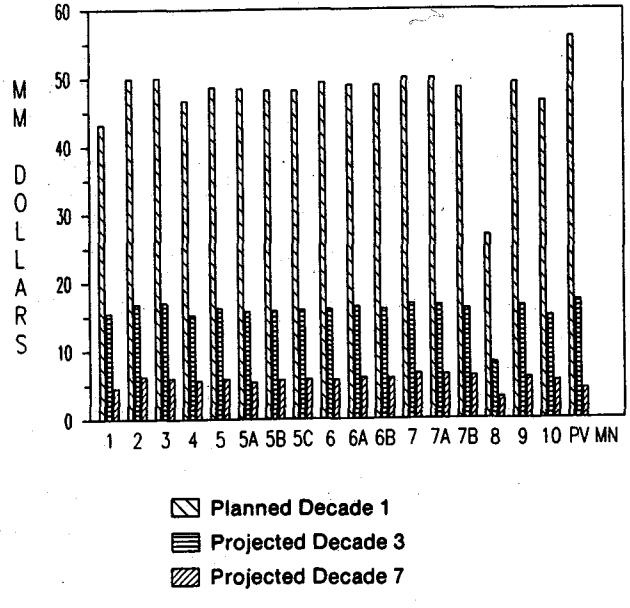


TABLE II-17

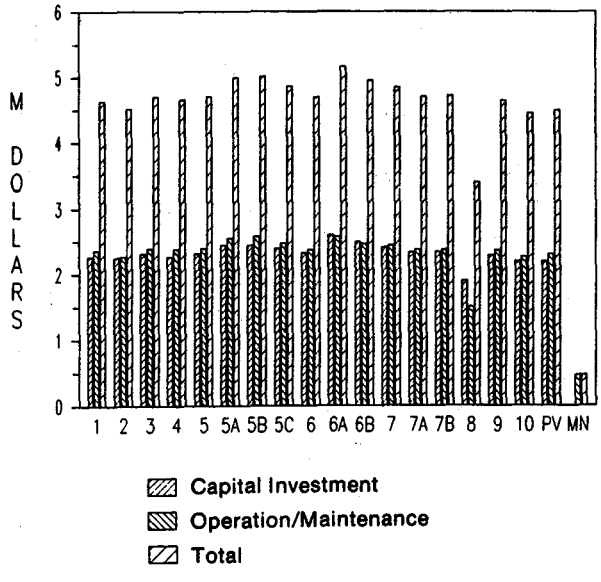
AVERAGE ANNUAL COSTS IN DECADE 1 (COSTS IN MILLIONS OF DOLLARS—1978 DOLLARS)

Alternative/ Benchmark	Total Cost	Capital Investment Costs	Operational
1	7.1	2.27	2.36
2 (RPA)	6.8	2.25	2.27
3	7.1	2.31	2.39
4	7.1	2.27	2.38
5	7.1	2.31	2.39
5a	7.6	2.44	2.55
5b	7.7	2.44	2.57
5c	7.4	2.39	2.47
6	7.1	2.32	2.37
6a	7.7	2.59	2.57
6b	7.3	2.49	2.46
7	7.3	2.41	2.43
7a	7.1	2.33	2.37
7b	7.1	2.34	2.37
8 (C.M.)	4.5	1.89	1.50
9 (Dep.)	7.0	2.28	2.36
10 (P.A.)	6.7	2.19	2.26
Max.PNV	6.9	2.19	2.30

alternatives is for activities which are not significantly influenced by the objectives of the alternative. These costs vary from 2.4 to 3.88 million dollars and include such things as general administration, fire control, law enforcements, threatened and endangered species monitoring, firewood administration, and other programs. The Preferred Alternative 10 requires a budget of 6.7 million dollars per year.

FIGURE II-23

PROJECTED BUDGET, CAPITAL INVESTMENT AND OPERATIONS (Decade 1)



d. Present Value Costs

The present value cost is the sum of all expenditures for 150 years discounted at 4 percent. The minimum discounted cost for Federal ownership of the Forest is 1.4 million dollars as defined by the minimum level benchmark. The maximum discounted cost is $192 million for Alternatives 5b and 7 (RPA). Figure II-24 displays how the discounted costs and benefits vary among the alternatives.

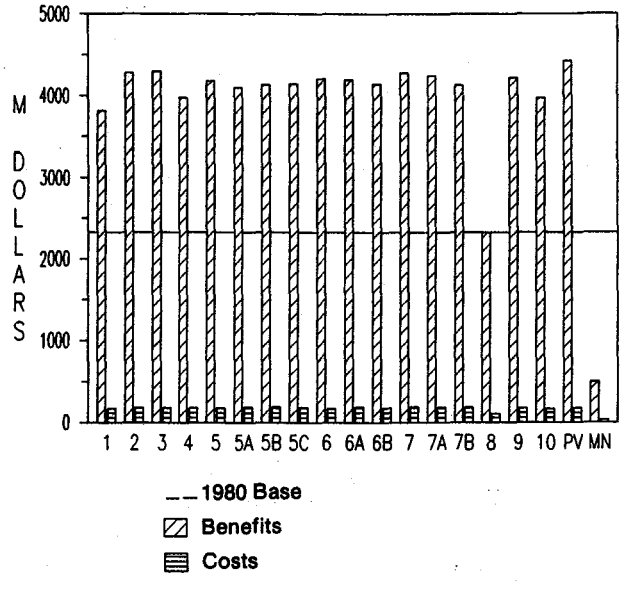
A further breakdown of discounted benefits and costs by resource group is displayed in Table II-18. Again the alternatives are ranked by PNV.

e. Annual Priced Benefits

Annual priced benefits are those values associated with outputs that can be measured in dollars. The average annual economic benefits for decade one are displayed in Table II-19 and in Figure II-25 by alternative by two resource categories: market and non-market. Market benefits are the sum of the benefits from timber sales, livestock grazing fees, mineral leases, campground fees, special use fees, firewood permits. Non-market benefits include the dollar values assigned to dispersed, wilderness, and wildlife related recreation use. The purpose of assigning benefit values to some resource is to display the full value that users are willing to pay for the resource. The annual economic value for market and non-market benefits for decades 1, 3, 5, and 7 are displayed in Table II-21 at the end of this chapter.

FIGURE II-24

PRESENT VALUE BENEFITS AND COSTS



f. Present Value Benefits

Present value benefits are displayed in Figure II-25 by alternative. Present value benefits are the sum of market and non-market values for the 75 year planning horizon discounted at 4 percent. Appendix B, Section IV, contains a more detailed discussion of priced benefits (market and non-market) that are not measurable in dollar terms (non-priced benefits). Discounted economic benefits by major resource category are displayed in Table II-18 and in Table II-21 at the end of this chapter.

The maximum PNV Benchmark has a present value benefits of $4,424 million. Alternative 3 has the highest present value benefits while Alternative 8 (current direction) has the lowest ($2,327 million). Oil and gas is the largest single contributor to gross benefits. For this reason the present value benefits of an alternative are largely affected by the amount of oil and gas production.

TABLE II-18

DISCOUNTED BENEFITS AND COSTS BY RESOURCE GROUP (MILLIONS OF 1978 DOLLARS)

Altern/Bmrk	Discounted Benefits					Discounted Costs					
	Minerals	Range	Wildlife	Recrea'n	Timber	Minerals	Range	Wildlife	Recrea'n	Timber	Other
Max.PNV	3857	271	190	97	8.2	6.5	49.2	7.4	14.7	10.3	86.7
3	3718	271	205	98	8.0	6.1	49.0	8.0	15.2	14.9	87.0
7	3711	288	174	96	7.7	6.0	57.9	6.6	14.9	18.8	87.7
7a	3686	288	174	90	7.5	6.0	57.2	6.5	13.8	15.4	87.1
9 (Dep)	3673	275	195	97	6.6	5.9	50.0	7.6	13.8	10.5	87.1
6	3639	275	195	97	3.8	5.9	49.8	7.3	13.1	9.9	86.8
6a	3622	280	190	97	7.6	5.9	51.3	7.4	15.0	20.5	87.3
5	3604	277	191	99	6.5	5.8	50.3	6.7	14.9	12.1	87.8
2 (RPA)	3715	287	178	96	5.7	6.0	53.6	7.0	13.9	14.0	87.2
6b	3587	280	188	84	7.2	5.7	51.5	7.4	12.4	15.2	86.2
5c	3569	277	191	100	6.4	5.8	50.3	6.4	16.0	15.9	87.9
7b	3571	288	173	91	7.4	5.8	57.6	8.1	13.7	14.3	86.6
5b	3560	277	190	100	6.2	5.8	50.1	8.1	18.3	15.8	93.5
5a	3524	277	189	101	7.3	5.8	49.7	8.0	17.9	14.0	92.5
10 (PA)	3404	264	208	92	3.3	5.4	48.6	7.8	11.4	6.1	85.7
4	3402	271	203	93	6.9	5.6	48.9	8.3	15.3	11.0	88.5
1	3246	230	246	87	3.1	5.0	39.5	11.4	15.3	9.0	91.0
8	1818	258	170	76	3.9	2.3	35.9	1.7	2.0	7.7	56.8
MIN LVL	244	0	181	74	0.0	0.0	0.0	0.0	0.4	0.0	32.5

[1] Note: The direct comparison of individual resource benefits and costs is misleading because the individual resource cost information does not include General Administration and other nonseparable costs. These are included in the "Other" cost category.

TABLE II-19

DECADE 1 AVERAGE ANNUAL MARKET AND NON-MARKET VALUES (VALUE IN MILLIONS OF 1978 DOLLARS)

Altern/Bmrk	Market MM$	Non-market MM$
1	208	7.3
2 (RPA)	235	7.2
3	241	7.3
4	225	7.2
5	234	7.4
5a	240	7.4
5b	239	7.4
5c	239	7.3
6	237	7.3
6a	244	7.3
6b	240	7.0
7	243	7.1
7a	245	7.0
7b	239	7.0
8 (C.M.)	135	6.5
9 (Dep.)	235	7.3
10 (P.A.)	222	7.2
Max.PNV	251	7.2
MIN	1	6.8

FIGURE II-25

AVERAGE ANNUAL MARKET AND NON—MARKET VALUE

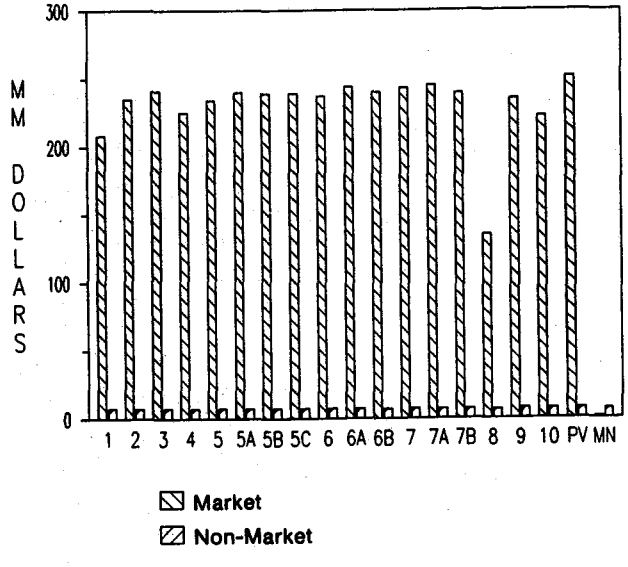
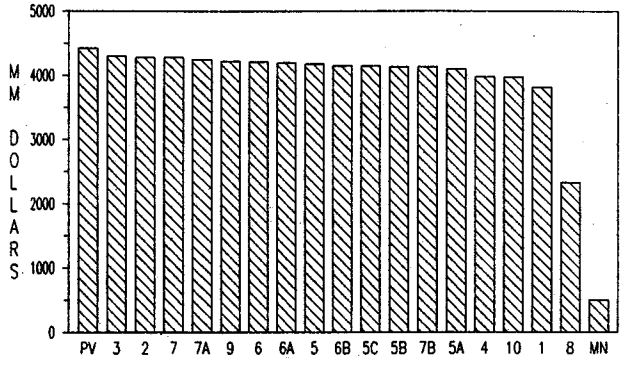


FIGURE II-26

PRESENT VALUE BENEFITS



19. Major Tradeoffs Among Alternatives

Summary of Changes Between the Draft and Final EIS

This is a new section which incorporates material from the Economic Impacts, Economic Comparison and Summary of Public Benefits sections of Chapter II of the EIS. An expanded discussion of National, Regional, and Local demand is also presented.

This section provides additional information to help identify the alternative or alternatives that come closest to maximizing net public benefit while meeting legal and environmental requirement and responding reasonably, equitably and effectively to the issues, concerns, and opportunities. This information describes the tradeoffs that would occur among the priced benefits and the non-priced benefits described previously. The adequacy of each alternative's attempt to address issues, concerns, and opportunities is influenced by the subjective values individual reviewers attribute to the different resource mixes and degrees of response.

a. National, Regional, and Local Demand Outlook

To provide a framework for assessing responses to issues, concerns, and opportunities, the long-term resource demands and needs of the nation, region, and local communities are reviewed briefly.

The RPA projects total national demands to rise for all outputs of National Forest: timber, minerals, forage, outdoor recreation opportunities, wildlife, wilderness, water supply and many amenity uses of forest and range lands. There is also a strong demand to protect and enhance the quality of the environment while meeting these demands. The markets into which commodities produced on the National Forest flow are generally regional or national. The nation benefits when supplies are provided from the most efficient sources of production.

Most of the timber processed from the Forest is marketed in the mid-west, but a good share of the timber is also used locally. The Forest's timber program is not a major resource activity but it does provide a small amount of timber for local mills. The demand for wood from the Forest has been sporadic with the closing of some local mills in the recent past. However, other mills within the Forest's zone of influence have recently demonstrated an interest in timber from the Forest. The demand for timber from the Forest is expected to be stable or slightly increase in the short-term future.

Energy and common variety minerals from the Forest are produced and processed both locally and regionally. The interest and success in the Williston Basin area has resulted in the development of a major source of domestic oil and gas. Exploration continues in order to define the limits of this reserve and to expand producing fields. There is also considerable interest and some exploration and development activities in the adjacent Powder River Basin. Depending on national and international politics and economic events, this interest is expected to increase, especially as the Nation attempts to become energy self-sufficient. Non-energy mineral interest has also hightened in the Stillwater complex area of the Beartooth District. The proposed Stillwater Mine has been recently approved and is currently assessing the viability of mining the strategic minerals of platinum and palladium.

The Custer Forest provides forage for the largest livestock grazing program within the National Forest System. Many of the local communities and economies are based on ranching and farming. The Forest provides a vital segment of the total forage needs on these ranchers. Most of the grazing occurs from mid-May to late November and serves to round out the yearlong livestock operations. livestock are generally shipped throughout the west and mid-west for processing. Some livestock are processed and sold locally within the states of Montana, South Dakota, and North Dakota.

Generally, users of National Forest outdoor recreation, wildlife and wilderness are local people or people from the area adjacent to the National Forest. Users of the Custer National Forest are primarily from the counties of south-central Montana, western South Dakota, and western North Dakota. However, the Little Missouri National Grasslands of western North Dakota are the only National Forest lands within

the State. Many people from eastern North Dakota come to this area to experience the scenic beauty, and the outdoor recreation opportunities afforded by the National Grasslands. Total recreation use of the Forest is projected to grow at least at the rate of population increase in the states.

Water is used locally for municipal water supplies, fisheries, recreation, hydroelectric power, irrigation, and for domestic livestock and wildlife. It is also used by downstream users on a regional and national level.

In 1980, goods and services from the Custer National Forest provided approximately 4,200 jobs and $162 million in Forest-related income.

b. Economic Values and Responses to Issues, Concerns and Opportunities

Relationships between priced and non-priced outputs illustrate the interactions of attempting to resolve various issues. Competitive public issues, management concerns, and resource opportunities exist and it is impossible to fully meet all wants and desires at the same time. By examining an array of priced and non-priced outputs it becomes possible to see what is given up and what is achieved as a range of alternatives is explored. An understanding of the tradeoffs between alternatives is required to help decision makers decide which alternative maximizes net public benefit. The mixes of priced and non-priced outputs resulting from each alternative are a direct result of the various attempts to resolve the public issues discussed in Chapter I.

Appendix A fully discusses each of the issues, concerns, and opportunities. The issues, concerns, and opportunities with the greatest influence on the alternatives and indicators of responsiveness include:

1) At what level of use and management intensity should livestock be managed on the Forest, considering public needs and demands for all resources? Indicators:

- potential livestock AUM of grazing

2) In response to national demands for energy and strategic minerals, how can the forest provide for mineral exploration and development while also providing for renewable resources? Indicators:

- level of oil and gas production
- percentage of high and very high energy mineral potential lands with access restrictions
- percentage of high and very high non-energy mineral potential lands with access restrictions

3) How and where will the resource base, including riparian (stream-bank) zones and woody draws, be managed and protected for wildlife in view of competition from other resources? Indicators:

- level of oil and gas production
- level of livestock grazing
- amount of surface occupancy restriction on mineral activities

4) What are the long-term public and resource management access needs and how should they be resolved? Indicators:

- miles of road
- road management policies

5) What is the long-range need for low development areas and how should they be managed? Indicators:

- amount of areas designated to wilderness and proposed wilderness
- acres of low development/roadless management

c. Differences and Similarities of Individual Alternatives

Table II-20 and the following discussion identify the tradeoffs between monetary goals (returns to the Treasure and PNV) and addressing the issues. The descriptions of these differences proceed from the alternatives with the highest PNV to the lowest.

In general PNV decreases as restrictions are placed on oil development and production. To a lesser extent, changes in PNV are due to less available livestock forage and fewer recreation opportunities. The benefits and costs of other programs are fairly constant among alternatives.

In Table II-20 the indicator identified above are used to show the degree of responsiveness of each alternative to the issues, concerns, and opportunities.

The discussion which follows deals with the major economic tradeoffs among the alternatives and issues addressed by each alternative. The alternatives are listed in order of decreasing PNV. For a more detailed discussion of resource constraints see Appendix B, Section VII and VIII of this FEIS.

1) Maximum PNV Benchmark

The maximum PNV Benchmark identifies the maximum PNV of the Forest at $4,249 million. This PNV results from meeting minimum management requirements for soil, air, and water, precluding timber management from existing wilderness, and opening all roadless areas to mineral exploration and development. No timber is harvested until the third decade at which time approximately 17 MMBF is harvested annually. In the absence of competing goals (management

TABLE II-20

INDICATORS OF RESPONSIVENESS OF ALTERNATIVES TO MAJOR ISSUES AND NATIONAL CONCERNS

—Estimated Outputs for Decade 1 with Projections for Subsequent Decades—

	Quantified Costs and Benefits				Issue Response Indicators	
	PNV	Average Annual Market Benefits By Decade 1/5	Average Annual Nonmarket Benefits By Decade 1/5	Average Annual Budget Decade 1	Livestock Grazing Issue	
	$ Million				Decade 1 MAUM's	Decade 5 MAUM's
Max PNV Benchmark	4,249	258/73	6.5/15.1	6.9	884	899
Alt. 3	4,120	242/62	6.7/16.0	7.1	887	898
Alt. 7	4,085	244/74	6.5/13.6	7.3	906	977
Alt. 7a	4,060	246/69	6.4/13.4	7.1	906	975
Alt. 9 (Departure)	4,042	236/56	6.7/15.2	7.0	893	914
Alt. 6 (Draft Preferred)	4,037	237/46	6.7/15.2	7.1	894	913
Alt. 6a	4,009	245/61	6.7/14.9	7.7	899	933
Alt. 5	4,001	235/54	6.7/15.1	7.1	896	920
Alt. 2	4,000	236/62	6.6/13.9	6.8	902	973
Alt. 6b	3,968	240/56	6.4/14.2	7.3	900	934
Alt. 5c	3,959	239/54	6.7/15.1	7.4	896	919
Alt. 7b	3,946	239/69	6.4/13.4	7.1	916	975
Alt. 5b	3,940	240/54	6.7/14.9	7.7	896	919
Alt. 5a	3,910	241/52	6.8/14.9	7.6	896	919
Alt. 10 (Preferred)	3,806	223/42	6.7/16.1	6.7	865	875
Alt. 4	3,798	225/56	6.6/15.8	7.1	887	898
Alt. 1	3,641	208/37	6.8/19.0	7.1	827	728
Alt. 8 (Current Direction)	2,220	136/30	6.7/15.2	4.5	878	833

	Issue Response Indicators				
	Wilderness/Roadless Issue		Minerals Issue		
			Oil Production		Energy Minerals-% of Moderate Through Very High Potential Lands with Access Restriction (A&B Category)
Alternative	Recommended Wilderness	Roadless in Decade 5	Decade 1	Cumlative Production	
	M Acres		MM Barrels		Percent
Max PNV Benchmark	0.0	0.0	17.6	350.5	9
Alt. 3	0.0	120.4	15.7	345.0	10
Alt. 7	9.8	93.1	15.6	344.4	9
Alt. 7a	47.6	80.3	15.6	341.9	12
Alt. 9 (Departure)	9.8	109.0	15.5	337.5	15
Alt. 6	11.8	125.5	15.5	337.2	14
Alt. 6a	36.6	120.1	15.3	335.9	14
Alt. 5	0.0	157.5	15.2	334.4	14
Alt. 2	.3	128.6	15.7	344.7	9
Alt. 6b	105.8	81.6	12.3	332.3	18
Alt. 5c	11.0	184.4	15.0	331.4	15
Alt. 7b	105.3	64.3	15.2	330.9	15
Alt. 5b	93.5	125.9	15.1	330.2	17
Alt. 5a	182.0	45.9	15.1	325.9	19
Alt. 10	11.8	114.7	14.6	315.9	20
Alt. 4	241.7	16.6	14.6	314.9	23
Alt. 1	129.0	116.8	13.5	301.6	26
Alt. 8	18.8	184.8	8.2	166.6	17

Issue Response Indicators

	Wildlife Issue						Access Issue		
	Elk Provided Capacity		Deer Provided Capacity		Potential Fish Population		Average Annual Miles of New Road Construction		Total Road Construction
	Decade 1	Decade 5	Decade 1	Decade 5	Decade 1	Decade 5	Decade 1	Decade 3	
Alternative	# Potential Elk		M Potential Deer		# Potential Fish		Miles	Miles	Miles
Max PNV Benchmark	684	681	22.1	24.5	427.8	436.4	7.5	3.4	5,685
Alt. 3	680	792	23.8	26.1	428.7	437.1	8.3	2.7	5,685
Alt. 7	677	681	21.9	22.0	424.2	432.8	8.6	2.8	5,685
Alt. 7a	685	678	22.0	22.0	424.2	432.8	8.5	2.6	5,678
Alt. 9 (Dep.)	845	797	24.2	25.4	427.8	436.6	8.0	2.6	5,666
Alt. 6	966	890	24.7	25.9	427.4	436.2	8.1	2.3	5,203
Alt. 6a	686	686	22.5	23.7	427.5	436.2	9.0	2.7	5,664
Alt. 5	835	785	24.0	24.8	427.0	435.7	5.9	2.0	5,098
Alt. 2	826	792	23.4	23.2	425.4	434.2	7.9	2.6	5,685
Alt. 6b	706	689	22.6	23.6	427.3	435.8	8.5	2.6	5,628
Alt. 5c	937	925	26.0	27.2	428.0	436.6	7.1	2.1	5,285
Alt. 7b	698	676	22.1	22.0	424.1	432.7	8.4	2.5	5,639
Alt. 5b	805	804	23.7	25.0	428.7	437.2	7.0	2.2	5,273
Alt. 5a	834	804	23.9	24.9	429.4	438.0	7.1	2.0	5,295
Alt. 10	972	917	27.7	29.3	427.9	436.3	7.9	2.1	5,650
Alt. 4	845	809	25.5	27.4	430.7	439.3	3.1	1.3	4,448
Alt. 1	1058	1072	30.2	36.9	432.9	441.0	3.2	1.0	4,447
Alt. 8	1042	797	26.5	27.2	425.9	429.6	6.1	1.6	4,400

Issue Response Indicators

	Timber Issue			Community Effects Issue		
	Average Annual Harvest Decade 1	LTSY	Suitable Timber Lands	Payments to Local Governments Decade 1	Forest Generated Private Sector Jobs Decade 1	Forest Generated Private Sector Income Decade 1
Alternative	MMBF	MMBF	M Acres	MM$/Year	Jobs	MM$/Year
Max PNV Benchmark	0.0	9.2	70.5	14.0	7,949	340
Alt. 3	4.4	10.6	118.4	12.5	7,512	312
Alt. 7	6.0	11.4	122.7	12.5	7,388	310
Alt. 7a	6.0	10.1	109.2	12.5	7,296	308
Alt. 9 (Departure)	3.1	7.4	73.1	12.3	7.307	307
Alt. 6	4.0	6.7	83.6	12.3	7,322	307
Alt. 6a	8.4	11.0	102.4	12.2	7,370	306
Alt. 5	4.1	8.2	80.5	12.2	7,309	304
Alt. 2	2.2	12.8	69.4	12.5	7,309	309
Alt. 6b	6.7	9.0	93.7	12.2	7,196	304
Alt. 5c	6.7	9.0	80.6	12.0	7,305	302
Alt. 7b	6.0	9.1	101.5	12.1	7,182	302
Alt. 5b	6.7	8.7	77.2	12.1	7,327	303
Alt. 5a	6.7	7.0	80.4	12.1	7,360	304
Alt. 10	3.0	6.4	72.4	11.6	6,974	291
Alt. 4	3.4	6.4	87.5	11.7	7,058	291
Alt. 1	3.5	7.4	122.4	10.8	6,182	265
Alt. 8	4.0	2.5	16.4	6.7	4,927	185

constraints) the production of most commodity products such as grazing, oil, and timber are at or above historic levels.

2) Alternative 3

Alternative 3 has the highest PNV of all the alternatives, $4,120 million. This is achieved through a high production of commodity outputs, especially oil. Timber harvest constraints insure minimum volumes of harvest by ranger district while allowing some harvest flexibility from period to period. This resulted in a beginning harvest level of 4.4 MMBF in the first period but by the fifth decade the harvest level is 6.0 MMBF. Of the

157,000 acres of tentatively suitable lands, 122,000 acres are designated to timber management. Livestock grazing would increase to 898,000 AUM's by the fifth decade. During the first decade, there would be a slight decrease due to the impacts of oil and gas exploration and development. As a result of producing a high level of commodity goods and service, this alternative has the highest level of acres in a existing visual condition class of EVC:4 (Disturbed).

The objective of maximizing PNV results in this alternative producing 345 million barrels of oil over the planning horizon.

Wildlife, fish, and old growth receive less emphasis in this alternative. The elk population is predicted to decline to approximately 676 elk by the end of the planning horizon. This is somewhat less than the current estimated population of 950 elk. The provided capacity for deer is predicted to increase slightly to approximately 26,000 deer. Estimated fish numbers are expected to remain at the current level of approximately 429,000 fish for the first decade increasing slightly to 437,000 by the end of the seventh decade. This alternative has the second lowest percent (22 percent) of the suitable timber remaining in old growth at the end of the planning horizon.

This alternative would require about 1,880 miles of additional roads, primarily for oil and gas development and timber harvest and would result in the largest road system of all the alternatives. The most suitable timber land would be accessed within 30 years. Approximately 119,000 acres of inventoried roadless lands would be retained. These areas would be those areas of limited oil and gas potential and areas of unsuitable timber. There would be no additions to the national wilderness system, however, the Absaroka-Beartooth Wilderness would remain as wilderness. Roaded recreation opportunities are high in this alternative because of the road system necessary for oil and gas and timber management activities.

The economies of the local communities will generally be enhanced over the current situation. This alternative provided the greatest opportunity for employment and returns to the local counties. However, some community instability may occur as a result of increased oil and gas exploration and development early in the planning horizon and then a reduction in this activity in later decades.

This alternative will increase the production of certain commodity goods and services from the Custer National Forest and therefor help the Forest meet its share of regional targets. However, there are some expected economic impacts on local communities, and some concern for the amenity resources such as visual quality, wildlife and fish, and special ecosystem such as hardwood draws.

This alternative as a forgone benefit of $130 million.

3) Alternative 7

Alternative 7 has the second highest PNV of all the alternatives, $4,085 million.

The objective of this alternative is to produce a high level of market goods and services that would contribute to the National and local economies but do it in a cost-efficient manner. The development of this alternative was guided by economic efficiency criteria, after requiring that basic resource protection needs be met and certain timber harvest, livestock grazing, and oil production requirements be achieved.

Oil production in this alternative would be 344 million barrels, one of the highest levels. There would be few restrictions on development. This alternative would harvest 6.0 MMBF in the first period but by the fifth decade the harvest level would increase to 11.2 MMBF. Of the 157,000 acres of tentatively suitable lands, 132,500 acres are designated to timber management. The long-term sustained yield is the second largest of the seventeen alternatives. Livestock grazing would increase to 976,000 AUM's by the end of the planning horizon. This level of grazing is the highest among all the alternatives. The proportion of forage available to wildlife would shift to favor livestock, and range management would be emphasized on nearly 661,000 acres. This would mean many complex grazing systems would be needed to produce and utilize the forage, thus requiring greater investments from the Forest and the livestock producers. As a result of producing a high level of commodity goods and service, this alternative has the second highest level of acres in a existing visual condition class of EVC:4 (Disturbed).

Wildlife, fish, old growth, and roadless values are addressed at relatively low levels in this alternative. The elk population is predicted to decline to approximately 681 elk by the end of the planning horizon. This is somewhat less than the current estimated population of 950 elk. The provided capacity for deer is predicted to remain at or near the current provided capacity of 21,000. Estimated fish numbers are expected to decrease slightly from the current estimated level of approximately 429,000 fish during the first decade increasing slightly to 433,000 by the end of the seventh decade. This alternative has the lowest percent (15 percent) of the suitable timber remaining in old growth at the end of the planning horizon.

This alternative would require about 1,882 miles of additional roads, primarily for oil and gas development and timber harvest and would result

in the largest road system of all the alternatives. The most suitable timber land would be accessed within 30 years. Of the 258,280 acres of currently inventoried roadless lands, 92,800 acres or 35 percent would be retained, maintaining the sixth smallest amount of roadless acres. These areas would be those areas of limited oil and gas potential and areas of unsuitable timber. There would be one additional area (Lost Water Canyon) classified as wilderness, however, the Absaroka-Beartooth Wilderness would remain as wilderness.

Dispersed recreation activities would increase, particularly driving for pleasure and other road-related activities in response to the greater miles of roads. Wildlife-related activities, including hunting and fishing, would increase, but to nearly the lowest level of all alternatives.

Alternative 7 has employment opportunities in the private sector which are greater than the current situation. Of all the alternatives, Alternative 7 ranks second in private sector jobs related to the Forest programs and outputs. This alternative also ranks second in the amount of revenue returned to the local states.

If the Forest were managed according to this alternative, it would yield more commodity outputs than it is currently. However, the Forest would not continue to produce nonpriced benefits at the current levels. Concerns for amenity resources such as hardwood draws may not be met. Some community instability may occur as a result of increased oil and gas exploration and development early in the planning horizon and then a reduction in this activity in later decades. Greater investments in range improvement would be required on the part of the livestock producers.

This alternative as a forgone benefit of $130 million.

4) Alternative 7a

Alternative 7a has the third highest PNV of all the alternatives, $4,060 million.

This alternative is similar to Alternative 7. However, the objective of this alternative was to create a high level of market goods and services while significantly increasing the amount of wilderness and/or roadless acres. The development of this alternative was the same as Alternative 7 except that 47,600 acres were specified for wilderness classification in addition to the Absaroka-Beartooth Wilderness.

Comparisons with the alternatives are essentially the same as with Alternative 7 except (1) slightly lower production of timber, oil and gas, and livestock grazing, (2) 47,600 acres are designated as additional wilderness, and (3) the resulting decrease in dispersed motorized recreation opportunity.

Of the 258,280 acres of currently inventoried roadless lands, 80,300 acres or 30 percent of the inventoried roadless areas would be retained, maintaining the forth smallest amount of roadless acres. These areas would be those areas of limited oil and gas potential and areas of unsuitable timber.

The social and economic comparisons would be essentially the same as with Alternative 7, however, Alternative 7b somewhat fewer jobs in the private sector.

This alternative as a forgone benefit of $190 million.

5) Alternative 9

The PNV of Alternative 9 (Dep) is $4,042. This alternative was formulated to produce a moderate level of both market and nonmarket outputs. It provided for nonmarket resources as in Alternative 6 and bases commodity levels on a balanced resource management program and economic efficiency. It also seeks to improve the age class distribution of the Forest, reduce risk of insect damage, and increase timber outputs in the short run by allowing a departure from a non-declining flow of timber.

This resulted in a beginning harvest level of 3.1 MMBF annually in the first period but increases to 8.0 MMBF annually during the third decade. By the seventh decade the timber harvest level declines to 4.1 MMBF annually. Of the 157,000 acres of tentatively suitable lands, 85,000 acres are designated to timber management.

Alternative 9 produced the fourth highest cumulative oil production (338 million barrels) all the alternatives. Mineral leases in recommended wilderness areas would not be reissued and leases in the roadless areas would either be not reissued or reissued with surface occupancy stipulations.

Livestock grazing would continue at approximately the current level but would increase to 914,000 AUM by the end of the planning horizon. Allotment management would be implemented to maintain a "fair" or better range condition. The forage allocation to wildlife would be increased, especially in key habitats. Some additional investments would be required on the part of the Forest and the livestock producers.

This alternative result in the third highest impact to the visual resources. By the end of the planning horizon, 210,000 acres would be classified as EVC:4 (Disturbed).

Wildlife, fish, and old growth receive a moderate emphasis in this alternative. The elk population is predicted to decline to approximately 797 elk by the end of the planning horizon due to the amount of timber harvested. This is somewhat less than the current estimated population of 950 elk. The provided capacity for deer is predicted to

increase slightly to approximately 25,400 deer ranking this alternative eighth highest. Estimated fish numbers are expected to remain at the current level of approximately 429,000 fish for the first decade increasing slightly to 437,000 by the end of the seventh decade.

With the departure from non-declining yield, much of the current old growth timber on the suitable timber base would be harvested early in the planning horizon. By the end of the seventh decade 46 percent of the suitable timber base would be classified as old growth ranking this alternative sixth highest.

This alternative would require about 1,863 miles of additional roads, primarily for oil and gas development and timber harvest and would result in the fifth largest road system of all the alternatives. The most suitable timber land would be accessed within 30 years.

Approximately 109,000 acres (42 percent of total roadless inventory) of inventoried roadless lands would be retained. These areas would be those areas of limited oil and gas potential and areas of unsuitable timber. The Lost Water Canyon Area would be added to the national wilderness system, and the Absaroka-Beartooth Wilderness would remain as wilderness. Roaded recreation opportunities are high in this alternative because of the road system necessary for oil and gas and timber management activities.

The economies of the local communities will generally be enhanced over the current situation. This alternative provided the greatest opportunity for employment and returns to the local counties. However, some community instability may occur as a result of increased oil and gas exploration and the large fluctuations in timber harvest levels early in the planning horizon.

This alternative will increase the production of certain commodity goods and services such as oil and gas, timber, and forage for wildlife and livestock from the Custer National Forest and therefore help the Forest meet its share of regional targets. However, there are some expected economic impacts on local communities. This alternative would provide for an estimated 3,105 additional jobs and return approximately $145 million to local economies.

This alternative as a forgone benefit of $207 million.

6) Alternative 6

This alternative has a PNV of $4,037 million which ranks sixth among all alternatives. This alternative was the preferred alternative in the Draft EIS and was formulated to address the issues, concerns, and opportunities facing the Custer Forest.

This alternative is similar to Alternative 9. It was designed to produce a moderate level of commodity goods and services while at the same time being responsive to nonmarket outputs. This alternative was also formulated to yield a stable supply of timber for the local demand of the small mills. This was done through a constraint of non-declining yield of timber harvest.

Comparisons with the alternatives are essentially the same as with Alternative 9 except (1) slightly lower production of oil and gas, and livestock grazing, (2) 11,800 acres are designated as additional wilderness, and (3) significantly lower timber harvest, especially in the first 30 years.

Of the 258,280 acres of currently inventoried roadless lands, 125,100 acres or 47 percent of the inventoried roadless areas would be retained, maintaining the seventh largest amount of roadless acres. These areas would be those areas of limited oil and gas potential and areas of unsuitable timber.

The nonpriced objectives of this alternative result in a difference in PNV of $212 million. The major cause of this decrease is the reduction in the production of oil and gas due to the amount of roadless acres. Concerns for wildlife also contribute to the foregone value primarily by limiting timber harvest scheduling opportunities.

The social and economic comparisons would be essentially the same as with Alternative 9, however, in Alternative 6 provides slightly fewer jobs in the private sector.

7) Alternative 6a

Alternative 6a ranks seventh in PNV with a value of approximately $4,009 million.

This alternative is similar to Alternative 6. However, the objective of this alternative was to create a moderate to high level of market goods and services and a moderate level of nonmarket goods and services while significantly increasing the amount of wilderness acres over that of Alternative 6. It does so by protecting wildlife habitat, water quality, fisheries habitat, and primitive and non-motorized recreation opportunities, and allowing economic efficiency to determine timber, livestock, and oil and gas production.

Alternative 6a has planned first decade livestock grazing levels of approximately 899,000 AUM's annually. Projected fifth decade levels are 933,000 AUM's. These are the sixth highest grazing levels among all alternatives and slightly more greater than the current situation (Alternative 8).

Oil and gas production is estimated at 336 million barrels over the planning horizon which is slightly less than Alternative 6 and ranking eighth among all the alternatives.

Alternative 6a has the largest first decade timber harvest program of all alternatives. The long term sustained yield is 11.4 MMBF annually which is the third largest among the alternatives. The suit-

able timber land base at 122,000 acres is the second largest of all alternatives.

This alternative results in the eighth highest impact to the visual resources. By the end of the planning horizon, 207,000 acres would be classified as EVC:4 (Disturbed).

Wildlife, fish, and old growth receive a moderate emphasis in this alternative. The elk provided capacity is predicted to decline to approximately 686 elk by the end of the planning horizon due to the amount of timber harvested. This is somewhat less than the current estimated population of 950 elk. The provided capacity for deer is predicted to increase slightly to approximately 23,700 deer ranking this alternative sixth lowest. Estimated fish numbers are expected to decrease slightly to 427,500 in the first decade increasing slightly to 436,200 by the end of the seventh decade.

With the increase in the volume of timber harvest, old growth timber on the suitable timber base would decline to 18 percent by the end of the planning horizon, with only one other alternative (Alternative 7) providing less old growth habitat.

This alternative would require about 1,861 miles of additional roads, primarily for oil and gas development and timber harvest and would result in the sixth largest road system of all the alternatives. The most suitable timber land would be accessed within 30 years.

Approximately 120,000 acres (47 percent of total roadless inventory) of inventoried roadless lands would be retained. This is slightly lower than Alternative 6 and ranks seventh highest among all alternatives. Compared to Alternative 6, Alternative 6a more than triples the amount of new wilderness. Approximately 37,000 acres would be recommended for additional wilderness, ranking this alternative seventh highest overall.

The economies of the local communities will generally be enhanced over the current situation. This alternative provided the third largest number of jobs in the private sector and an estimated $144 million in return to the local counties. However, some community instability may occur as a result of increased oil and gas exploration. The timber sector of the local economies would benefit from the increased, stable supply of timber.

This alternative as a forgone benefit of $207 million compared to the maximum PNV Benchmark. The primary factors contributing to the reduction in PNV from that obtained in the benchmark are increased outputs of timber and livestock grazing and a slight reduction in oil and gas production. Livestock management intensity and timber harvest are somewhat higher than what is most economical. The combination of a high amount of wilderness and roadless acres also reduces the amount of oil and gas production. This reduces the potential economic benefits.

8) Alternative 5

The PNV of Alternative 5 is approximately $4,001 million. The objective of this alternative is to achieve the level of market and nonmarket goods and services identified in the currently approved unit plans, and multiple-use plans that cover the Custer Forest. Due to past budget limitations, many parts of these plans could not be fully implemented. In the analysis that accompanied this alternative, the budget was unconstrained. The overall objective was to determine the feasibility of unit plans, the necessary budget to fully implement these plans, and the economic and environmental tradeoffs associated with unit plan management.

Timber harvest in the first decade would be approximately 4.1 MMBF and would increase to 7.0 MMBF by the third decade. Timber harvest would remain at this level for the remainder of the planning horizon. This ranks the alternative approximately in the "middle of the pack" of all the alternatives. This level of timber harvest would be achieved through designating 94,300 acres to timber management. The long-term sustained yield would be 8.2 MMBF ranking this alternative tenth highest among the seventeen alternatives.

Alternative 5 would provide for a slight increase in livestock grazing over time. Grazing would increase to approximately 920,000 AUM's by the end of the planning horizon ranking this alternative seventh highest overall.

Oil production would increase in Alternative 5 over Current Direction (Alternative 8) as existing leases are developed. This alternative would forcast a first decade production of 15.2 million barrels and a cumulative production of approximately 334 million barrels. This ranks the alternative eighth in first decade production and eighth in overall total production. This production would be achieved by increased production in some areas of the Williston Basin and through the development of current leases on other portions of the Forest. However, existing roadless areas in North Dakota that have passed the surface occupancy cut-off date and have no production established within these roadless areas, would remain in a roadless or low development status. Directional drilling from outside these areas would be allowed, but this would increase costs to the lease developers.

Approximately 1,295 miles of additional roads will be needed under this alternative. This would be the fourth lowest of all the alternatives.

The provided capacity for elk would decrease from current capacity under this alternative. By the end of the planning horizon, the projected provided capacity for elk is estimated to be 785 elk. This is the seventh lowest among all the alternatives. The provided capacity for deer is

expected to increase slightly to approximately 24,800 by the end of the planning horizon. This is an estimated increase of about 5,000 deer over current direction. Estimated fish numbers will drop slightly in the first decade to approximately 427,000. By the end of the planning horizon fish numbers are estimated to increase to 435,700 which ranks this alternative sixth lowest in fish population. Alternative 5 is projected to retain 40 percent of the suitable timber base in old growth. This is seventh highest among all alternatives.

The production of market outputs will affect visual quality only slightly in this alternative. Although the amount of visually impacts acres (EVC:4 Disturbed) will increase over that currently existing, Alternative 5 has the third lowest number of visually impacted acres in the first decade.

Opportunity for dispersed recreation increases in Alternative 5. In response to the objectives of the unit plans, this alternative would provide for the second highest disperse RVD's of all alternative. This would be accomplished by maintaining many of the roadless areas in a roadless or low developed status.

No additional areas would be recommended for wilderness classification under Alternative 5. However, approximately 158,000 acres would be maintained in a roadless or low development status. This would include all of the areas in North Dakota not currently producing oil and gas. This alternative would maintain the third highest acreage in a roadless status.

Alternative 5 ranks ninth highest in private sector job opportunities and eighth highest in return to local counties in decade one. Opportunities are greater in all decades than it the current situation. Some social and economic effects would be evident in this alternative. The increases in timber harvest and livestock grazing would tend to stablize those sectors of the local economies. As oil and gas exploration and development moved into other areas of the Forest, some instability could result in the local communities.

The difference in PNV of this alternative as compared to the maximum PNV Benchmark is $248 million (forgone benefit). It occurs because both timber and range outputs are above the most economical level. Also, the amount of roadless acres decreases the production of oil and gas which reduces a major benefit generating activity on the Forest.

The major non-priced benefits of this alternative are protection of visual quality and sustained high levels of local employment and income. The primary tradeoff of managing under this alternative would be the forgone benefit associated with a level of oil and gas production than that which is most economical.

9) Alternative 2

The PNV of Alternative 2 is approximately $4,000 million. The objective of this alternative is to meet the direction in the "Revised President's Statement of Policy", which states that "at least one alternative in the EIS will be developed to determine how the 1980 Forest and Rangeland Renewable Resources Planning Act (RPA) program could best be implemented on the Forest." The Forest's projected program outputs, activities, and costs are assigned through the Northern Region Guide in response to National demand. As such, this alternative would explore th production compatibility among resources with RPA projections in timber, minerals, livestock grazing, and recreation.

Timber harvest in the first decade would be approximately 2.2 MMBF and would increase to 8.8 MMBF by the fifth decade. Timber harvest would decrease slightly to 8.0 MMBF during the later decades of the planning horizon. The harvest of 8.8 MMBF during the fifth decade ranks this alternative as the fifth highest among all alternatives. This level of timber harvest would be achieved through designating 102,000 acres to timber management. The long-term sustained yield would be 12.8 MMBF ranking this alternative the highest among the seventeen alternatives.

Alternative 2 would provide for a significant increase in livestock grazing. Livestock grazing would increase to 973,000 AUM's by the end of the planning horizon resulting in this alternative being forth highest among all alternatives in livestock grazing. This alternative is exceeded in livestock grazing only by alternatives 7, 7a and 7b which emphasize a high level of market outputs.

Oil production would increase significantly in Alternative 2 over Current Direction (Alternative 8) as existing leases are developed. This alternative would forecast a first decade production of 15.7 million barrels and a cumulative production of approximately 345 million barrels. This ranks the alternative second in first decade production and second in overall total production. This production would be achieved by increased production in some areas of the Williston Basin and through the development of current leases on other portions of the Forest. The existing roadless areas in North Dakota that have passed the surface occupancy cut-off date would be opened for exploration and development. All areas, except the Absaroka-Beartooth Wilderness and Lost Water Canyon, would be available for oil and gas leasing. The objective of maximizing PNV would result in the most profitable areas being developed first.

Approximately 1,882 miles of additional roads will be needed under this alternative. Alternative 2, along with Alternatives 3 and 7, would require the largest amount of new roads.

The provided capacity for elk would decrease from current capacity under this alternative. By the end of the planning horizon, the projected provided capacity for elk is estimated to be 782 elk. This is the eighth lowest among all the alternatives. The provided capacity for deer is expected to increase slightly over current estimated populations to approximately 24,800 by the end of the planning horizon. However, this would be the fourth lowest among all the alternatives. Estimated fish numbers will drop slightly in the first decade to approximately 425,000. By the end of the planning horizon fish numbers are estimated to increase to 434,000 which ranks this alternative fifth lowest in fish population. Alternative 2 is projected to retain 35 percent of the suitable timber base in old growth. This is ninth highest among all alternatives.

The production of market outputs will affect visual quality significantly in this alternative. The acres visually impact (EVC:4 Disturbed) will increase to 272,000 acres in the first decade. By the end of the planning horizon this will decrease to 214,000 acres making this alternative the second highest in terms of the amount of visual impacts.

Although the opportunity for dispersed recreation increases in Alternative 2 over current direction, this alternative would the fifth lowest amount of dispersed recreation RVD's of all alternatives.

Two small additions would be made to the existing Absaroka-Beartooth Wilderness. However, approximately 128,600 acres would be maintained in a roadless or low development status. This would include most of the areas in Montana not currently producing oil and gas. This alternative would maintain the fourth highest acreage in a roadless status.

Alternative 2 ranks sixth highest in private sector job opportunities and third highest in return to local counties in decade one. Opportunities are greater in all decades than in the current situation. Some social and economic effects would be evident in this alternative. The increases in timber harvest and livestock grazing would tend to stabilize those sectors of the local economies. However, additional investments by the local livestock producers and the Forest would be required to implement more intensive range management systems. As oil and gas exploration and development moved into other areas of the Forest, some instability could result in the local communities.

The difference in PNV of this alternative as compared to the maximum PNV Benchmark is $249 million (forgone benefit). It occurs because both timber and range outputs are above the most economical level. Some scheduling constraints on the timber harvest reduce the overall benefit from this resource activity. Also, the amount of roadless acres decreases the production of oil and gas which reduces a major benefit generating activity on the Forest.

This alternative will provide the Forest's share of regional targets for timber, recreation, and oil and gas. The regional target for livestock grazing can be met until the third decade. The regional target cannot be met after this due to conflicting resource demands.

The major non-priced benefits of this alternative are sustained high levels of local employment and income. The primary tradeoff of managing under this alternative would be the forgone benefit associated with a level of oil and gas production than that which is most economical. There are substantial concerns for amenity resources such as visual quality, dispersed recreation, and fish and wildlife habitat since these resources are addressed only as by-products of management for timber, livestock grazing, and oil and gas exploration and development.

10) Alternative 6b

Alternative 6b ranks tenth in PNV with a value of approximately $3,968 million.

This alternative is similar to Alternatives 6 and 6a. However, the objective of this alternative was to create a moderate to high level of market goods and services and a moderate level of nonmarket goods and services while significantly increasing the amount of wilderness acres over that of Alternatives 6 and 6a. It does so by protecting wildlife habitat, water quality, fisheries habitat, and primitive and non-motorized recreation opportunities, and allowing economic efficiency to determine timber, livestock, and oil and gas production.

Comparisons of Alternatives 6 and 6a with the other alternatives are essentially the same for Alternative 6b except (1) slightly lower oil and gas production, (2) lower timber harvest in Alternative 6b, and (3) lower employment opportunities and returns to the local counties.

The major difference in this alternative from Alternatives 6 and 6a is the treatment of roadless areas on the Forest. In Alternative 6b, 105,800 acres of additional wilderness would be recommended. This is the fourth highest amount of recommended wilderness of all the alternatives. Although the amount of roadless acres decreases slightly from Alternative 6 and 6a, this alternative designates 81,600 to a roadless or low development status.

This alternative as a forgone benefit of $281 million compared to the maximum PNV Benchmark. The primary factors contributing to the reduction in PNV from that obtained in the benchmark are decreased outputs of oil and gas, and the scheduling requirements associated with timber harvest.

11) Alternative 5c

The PNV of Alternative 5c is approximately $3,959

million. The objective of this alternative is to maintain or increase the level of outputs identified in the current approved unit plans and multiple-use while designating more wilderness and/or roadless on the Forest.

Timber harvest in the first decade would be approximately 6.7 MMBF and would increase to 7.0 MMBF by the third decade. The first decade harvest level would be significantly higher than that of Alternative 5 but the same as Alternative 5a, 5b and 6b. This would rank these alternatives second highest in first decade harvest level among all alternatives. This level of timber harvest would be achieved through designating 104,300 acres to timber management. The long-term sustained yield would be 9.0 MMBF ranking this alternative seventh highest among the seventeen alternatives.

Alternative 5c would provide for a slight increase in livestock grazing over time. Grazing would increase to approximately 920,000 AUM's by the end of the planning horizon ranking this alternative, and Alternative Alternative 5, seventh highest overall.

Oil production would increase in Alternative 5c over Current Direction (Alternative 8) but it would be slightly lower than Alternative 5 due to the increase in wilderness and roadless area designation. This alternative would forecast a first decade production of 15.0 million barrels and a cumulative production of approximately 331 million barrels. This ranks the alternative eleventh in first decade production and tenth in overall total production. This production would be achieved by increased production in some areas of the Williston Basin and through the development of current leases on other portions of the Forest. However, existing roadless areas in North Dakota that have passed the surface occupancy cut-off date and have no production established within these roadless areas, would remain in a roadless or low development status. Directional drilling from outside these areas would be allowed, but this would increase costs to the lease developers.

Approximately 1,482 miles of additional roads will be needed under this alternative. This is approximately 200 miles more than Alternative 5 but almost the same as the amount of new road construction needed in Alternatives 5a and 5b. This would be the seventh lowest of all the alternatives.

The provided capacity for elk is projected to decrease slightly from current capacity under this alternative. By the end of the planning horizon, the projected provided capacity for elk is estimated to be 925 elk. This projected capacity would be somewhat higher than that of Alternatives 5, 5a, and 5b. Overall, Alternative 5c ranks second among all the alternatives. The provided capacity for deer is expected to increase to approximately 27,200 by the end of the planning horizon. This is an estimated increase of about 6,000 deer over current populations, and is slightly higher than that of Alternative 5, 5a, and 5b. Estimated fish numbers will drop slightly in the first decade to approximately 428,000. By the end of the planning horizon fish numbers are estimated to increase to 436,600 which ranks this alternative fifth highest in fish population. Alternative 5c is projected to retain 33 percent of the suitable timber base in old growth. This is sixth lowest among all alternatives.

The production of market outputs will affect visual quality only slightly in this alternative. Although the amount of visually impacts acres (EVC:4 Disturbed) will increase over that currently existing, Alternative 5c has the fifth lowest number of visually impacted acres in the first decade.

Opportunity for dispersed recreation increases in Alternative 5. In response to the objectives of the unit plans, this alternative would provide for the third highest disperse RVD's of all alternative. This would be accomplished by maintaining many of the roadless areas in a roadless or low developed status.

Alternative 5c would recommend 11,000 acres for wilderness classification, and maintain approximately 184,400 acres in a roadless or low development status. This would include all of the areas in North Dakota not currently producing oil and gas. This alternative would maintain the second highest acreage in a roadless or low developed status.

Alternative 5c ranks seventh lowest in private sector job opportunities and fifth lowest in return to local counties in decade one. Opportunities are greater in all decades than it the current situation. Some social and economic effects would be evident in this alternative. The increases in timber harvest and livestock grazing over current direction (Alternative 8) would tend to stabilize those sectors of the local economies. As oil and gas exploration and development moved into other areas of the Forest, some instability could result in the local communities.

The difference in PNV of this alternative as compared to the maximum PNV Benchmark is $290 million (forgone benefit). It occurs because both timber and range outputs are above the most economical level. Also, the amount of roadless acres decreases the production of oil and gas which reduces a major benefit generating activity on the Forest.

The major non-priced benefits of this alternative are protection of visual quality and sustained high levels of local employment and income. The primary tradeoff of managing under this alternative would be the forgone benefit associated with a level of oil and gas production than that which is most economical.

12) Alternative 7b

The objective of Alternative 7b was to emphasize a high level of market outputs while providing a high level of wilderness and/or roadless status for the currently inventoried roadless areas on the Forest.

The PNV of this alternative is $3,946 million, which is $303 million less than the Maximum PNV Benchmark. This alternative ranks twelfth in PNV compared to all the alternatives.

Comparisons of Alternative 7b with the other alternatives are essentially the same for Alternative 6b except (1) slightly lower oil and gas production, and (2) higher livestock grazing than in Alternative 6b.

The major difference in this alternative from Alternatives 6b is the treatment of roadless areas on the Forest. Alternatives 7b would designate somewhat smaller amount (64,300) to a roadless or low development status as compared to Alternative 6b (81,600). Each of the alternatives would recommend slightly over 105,000 acres be added to the National Wilderness System.

The forgone benefit in Alternative 7b is primarily due to the slight decrease in oil production compared to Alternative 6.

13) Alternatives 5b and 5a

The objective of these alternatives was similar to Alternatives 5 and 5c. These alternatives were formulated to explore additional ranges of wilderness and roadless designations, while maintaining or increasing market outputs over those levels identified in currently approved unit and multiple-use plans.

The PNV's of these alternatives are $3,940 and $3,910 respectively. This ranks the alternatives thirteenth and fourteenth respectively, and represents a forgone benefit of $309 million in Alternative 5b and $339 million in Alternative 5a when compared to the Maximum PNV Benchmark.

Comparisons of Alternatives 5b and 5a with the other alternatives are essentially the same for Alternative 5c except (1) slightly higher oil and gas production, (2) lower estimated elk populations than in Alternative 5c, and (3) slightly higher employment opportunities and returns to the local counties.

The major difference in this alternative from Alternatives 5c is the treatment of roadless areas on the Forest. In Alternative 5a, 182,000 acres of additional wilderness would be recommended while Alternative 5b would recommend approximately 93,500 acres to wilderness. This compares to the 11,000 acres of recommended wilderness in Alternative 5c. Alternative 5a recommends the second highest amount of wilderness among all alternatives. Alternatives 5b and 5a would designate somewhat smaller amount to a roadless or low development status as compared to Alternative 5c.

The forgone benefit in these alternative is primarily due to the slight decrease in oil production as a result of the wilderness and roadless designations. The increase in timber harvest, along with timber scheduling requirements, and livestock grazing above economical levels also decrease the net PNV.

14) Alternative 10 (Preferred Action)

This alternative is a modification of Alternative 6 which was the preferred alternative in the Draft EIS. It was formulated to address the issues, concerns, and opportunites before the Forest, and to address the public response to the issues raised in the Draft EIS. The objective of this alternative is to provide a mix of resource uses that respond to local, regional, and national needs. Commodity oriented activities occur at levels that continue to support community stability and foster the historic ranching/farming lifestyle. This alternative seeks to emphasize wildlife management objectives on portions of the Forest, and to provide a great amount of roadless/low development status for some areas than that offered in Alternative 6.

The PNV of Alternative 10 is approximately $3,806 million. Compared to the Maximum PNV Benchmark this is a forgone benefit of $443 million. This ranks Alternative 10 fifteenth among the seventeen alternatives in PNV.

Timber harvest in the first decade would be approximately 3.0 MMBF and would continue at this level throughout the planning horizon. This ranks Alternative 10 second lowest among all alternatives in the amount of timber harvest in the first decade. Over the entire planning horizon, Alternative 10 would harvest the least amount of timber of any alternative. This level of timber harvest would be achieved through designating 72,360 acres to timber management. The long-term sustained yield would be 6.4 MMBF ranking this alternative second lowest among the seventeen alternatives.

Alternative 10 would maintain the existing level of livestock grazing over time. Some short term reduction in grazing may occur on allotments heavily impacted by oil and gas early in the planning horizon. Livestock grazing on other allotments may be increased as management is intensified. Overall, the level of livestock grazing would remain at or near current levels providing for community stability in this segment of the local economies.

Oil production would increase substantially in Alternative 10 over Current Direction (Alternative 8) as existing leases are developed. This alternative would forecast a first decade production of 14.6 million barrels and a cumulative production

of approximately 316 million barrels. This ranks the alternative fourth lowest in total production among all the alternatives. This production would be achieved by increased production in some areas of the Williston Basin and through the development of current leases on other portions of the Forest.

Approximately 1,847 miles of additional roads will be needed under this alternative. This would be the seventh highest of all the alternatives.

The provided capacity for elk would decrease slightly from current capacity under this alternative. By the end of the planning horizon, the projected provided capacity for elk is estimated to be 917 elk. This is the fourth highest among all the alternatives. The provided capacity for deer is expected to increase to approximately 29,300 by the end of the planning horizon. This is an estimated increase of about 8,000 deer over current direction ranking the alternative second highest among the seventeen alternatives. Estimated fish numbers will drop slightly in the first decade to approximately 428,000. By the end of the planning horizon fish numbers are estimated to increase to 436,300 which ranks this alternative eighth highest fish population. Alternative 10 is projected to retain 54 percent of the suitable timber base in old growth. This is second highest among all alternatives.

The production of market outputs will affect visual quality only slightly in this alternative. Although the amount of visually impacts acres (EVC:4 Disturbed) will increase over that currently existing, Alternative 10 has the sixth lowest number of visually impacted acres in the first decade.

Opportunity for dispersed recreation increases in Alternative 10 over that projected for current direction (Alternative 8), but is lower than nine of the seventeen alternatives.

Some additional areas would be recommended for wilderness classification under Alternative 10. Approximately 11,800 would be recommended for classification in the National Wilderness System. This area would include part of the Lost Water Canyon Area, and parts of three of the roadless areas adjacent to the Absaroka-Beartooth Wilderness. Approximately 6,800 acres would be added to the existing Absaroka-Beartooth Wilderness. Alternative 10 would maintain 114,700 acres in a roadless or low development status. This would rank Alternative 10 tenth highest of the seventeen alternatives.

This alternative provides Forest related jobs and income opportunities at levels somewhat higher than the current situation but lower than most of the other alternatives (third lowest). Commodity outputs of range and timber are at or above current levels, are relatively constant and would contribute to community stability. Restriction on minerals accessibility and opportunities for exploration and development are moderate.

Foregone commodity production opportunities impose a cost of $443 million as compared to the Maximum PNV Benchmark. The primary factors contributing to the reduction in PNV from that obtained in the benchmark are reduced outputs of oil and gas, livestock grazing, and timber harvest. Forgone benefits from oil and gas development are partly the result of low development and lease stipulations needed to protect wildlife and soil, air, and water resources. Livestock grazing intensity is slightly lower than that which is most economical due to wildlife considerations and to protect special habitats such as woody draws. Additionally, timber harvest scheduling requirements and reduced harvest levels impact the PNV of this alternative. While commodity outputs remain at near current levels, Alternative 10 represents a significant shift in management of the Forest as compared to Alternative 8 which models current direction.

15) Alternative 4

The objective of this alternative is to emphasize the wilderness and recreation resources on the Custer National Forest. This alternative proposes to resolve the wilderness issue on the Forest by proposing the designation of all presently inventoried roadless areas as wilderness with the exception of the Tongue River Breaks area. This area was not considered for wilderness in any alternative but would continued to be managed as a roadless area. Economic efficiency criteria guided the response to other issues.

The timber harvest program in Alternative 4 is one of the smallest of all alternatives. Planned first decade allowable sale quantity is 3.4 MMBF ranking this alternative the fourth smallest among all alternatives. However, the projected fifth decade harvest increases to 7.6 MMBF. The long-term sustained yield of 6.4 MMBF is the second lowest among all alternatives and is based on 74,310 acres of suitable timber.

Livestock grazing increases very slightly over current levels. Planned first decade livestock AUM would average 887,000 AUM's annually and increase to 898,000 by the end of the fifth decade. As shown in the Maximum PNV Benchmark, this is the level of grazing that is most economical on the Forest, and is in general in the middle of the range of alternatives presented in the Forest Plan.

Oil production in this alternative is the fourth lowest of all alternatives in the first decade. This is due primarily to the emphasis on wilderness classification. Production remains somewhat high due to the existing level of leasing, and the emphasis on production of oil and gas outside of inventoried roadless areas.

Wildlife habitat potential for deer and fisheries and old growth habitat increases in this alternative. The provided capacity for deer is projected to increase to over 26,000 deer by the fifth decade. This is significantly higher than current direction and ranks the alternative sixth highest among all alternatives. Fisheries potential is projected to increase to over 437,000 fish by the fifth decade, a slight increase over the projection for current direction. Alternative 4 has the third lowest relative sediment risk ranking among the alternatives based on road construction, livestock grazing, and oil and gas production. By the end of the fifth decade, 53 percent of the suitable timber base will remain in oil growth habitat. This is the third highest of all alternatives. However, the provided capacity for elk is projected to decline somewhat over current direction. Planned provided capacity in the fifth decade would be approximately 809 elk as compared to 941 in Alternative 8 (Current Direction). This is primarily due to the grazing intensity on much of th elk winter range which lies outside of the areas proposed inclusion in wilderness.

Acreage to be recommended for wilderness designation and hence total roadless acreage are th highest in this alternative. One area, Tongue River Breaks would continue to be managed in a roadless status.

Due to the large acreage recommended for wilderness, this alternative has the third smallest projected road system and rate low in access opportunity.

This alternative has the fourth lowest opportunities for Forest related jobs and income in th private sector. Both income and number of jobs are, however, significantly higher than current levels during the first decade.

The foregone value of Alternative 4 is $451 million as compared to the Maximum PNV Benchnmark. This is primarily the result of foregone development opportunities (mostly oil and gas) on the additional areas that will be managed for wilderness.

This alternative best represents how the Forest would be managed if future development were allowed only in those areas which are presently roaded. Market outputs would be reduced but the wilderness recreation activity and habitat for wildlife would improve. Opportunities for non-wilderness, motorized recreation, mineral development, and forest related private sector jobs and income would be lower than most alternatives.

16) Alternative 1

Alternative 1 has a PNV of $3,641 million which ranks next to last among the seventeen alternatives. The objectives of this alternative are to emphasize wildlife management and to maintain a high level of roadless acres. In this alternative, valuable wildlife habitat and roadless areas were the most important considerations. Other concerns were o secondary importance whether related to market or nonmarket resources.

This alternative has a first decade allowable sale quantity of 3.5 MMBF which is the fifth lowest among the alternatives. By the fifth decade the allowable sale quantity is reduced to 2.6 MMBF which is the lowest of all the alternatives. The long-term sustained yield is 7.4 which ranks fifth lowest. This level of timber harvest is based on 83,000 acres of suitable timber.

The oil and gas production planned in decade 1 is 13.5 million barrels which is third lowest of all alternatives. Culumative production over the entire planning horizon is estimated to be 302 million barrels. Except for Alternative 8 (Current Direction) this is the lowest of all alternatives. This low level of production is due primarily to the access and occupancy stipulations necessary to provide for the high emphasis on wildlife habitat. Of the high and very high mineral potential lands (leasable minerals), a major portion would be moderately to highly restricted to mineral availability.

In order to provide for wildlife habitat needs, livestock grazing is reduced substantially in Alternative 1. By the end of the fifth decade livestock grazing would be reduced to 728,000 AUM's, the lowest of all the alternatives. This is considerably below even that of Alternative 8 (Current Direction) and only 81 percent of the most economical level identified in the Maximum PNV Benchmark.

Elk and deer habitat, fisheries potential, old growth and visual quality were all addressed at a moderate to high level in this alternative. Elk potential is increased over current estimated population levels. By the end of the fifth decade, elk provided capacity is projected to be 1072 elk, the highest of all alternatives. Likewise, the provided capacity for deer is expected to increase to 36,900 by the end of the fifth decade. Again, this is the highest of all alternatives. The fisheries potential by the end of the fifth decade is projected to increase to 441,000 fish, the highest of all alternatives. Old growth at the end of the planning horizon would be 47 percent of the suitable timber base which is fourth highest among all alternatives. Visual quality would improve in this alternative. By the end of the fifth decade, only 162,000 acres would be classified as EVC:4 Disturbed. This is the second lowest of all alternative and reflects the reduced impacts of the production of the market outputs of timber, livestock, and oil and gas.

Due to the large acreage recommended for wilderness and roadless, and the emphasis on wildlife, this alternative has the second smallest projected road system and rate low in access opportunity. In comparison to other alternative

the emphasis on wilderness and roadless areas is high. Alternative 1 would recommend 129,000 acres be added to the National Wilderness system and also retain approximately 117,000 acres in a roadless or low development status.

Forgone commodity production opportunities impose a cost of $608 million as compared to the Maximum PNV Benchmark. The primary factor contributing to the reduction in PNV from the obtained in the benchmark are reduced outputs of oil and gas, timber, and livestock grazing. Timber benefits foregone are partly the result of the designations of large areas to wilderness and roadless or low development status. Additionally, timber scheduling requirements to protect wildlife also affect the present net value. All three of the resources are produced at levels below the most economical level identified in the benchmark.

This alternative would have significant effects on community stability and the local economies. Alternative 1 ranks second lowest in Forest-related job opportunities and returns to the local communities in the first decade. The reductions in timber harvest and livestock grazing would cause instability in the traditional lifestyle of local communities. Some ranchers and farmers could be forced to look to other sources for livestock grazing due to the reduction of grazing on the Forest.

17) Alternative 8

Alternative 8 has the lowest PNV of all the alternatives, $2,220 million. This alternative projects the results of continuing to manage the Forest according to existing land use plans and policies. It fulfills the need to examine a no action alternative, and it assumes that all public issues are being adequately addressed by existing management plans and direction.

The first decade allowable sale quantity is 4.0 MMBF annually and decreases to 3.2 MMBF annually during the remainder of the planning horizon. This harvest level represents the average volume cut over the past 10 years on the Forest. This is the second lowest amount of timber harvest projected in all the alternatives. This alternative would manage approximately 31,000 acres as suitable timber, and it would have a long-term sustained yield of 2.5 MMBF annually, the lowest of all alternatives.

The projected oil and gas production in Alternative 8 is the lowest among all alternatives. First decade and cumulative production is estimated to be 8.2 and 167 million barrels, respectively. This alternative ranks the lowest in oil and gas production of all alternatives.

Planned first decade livestock grazing is 878,000 AUM's annually, which reflects currently permitted livestock numbers. Due to the impacts of oil and gas, livestock grazing is anticipated to decrease to approximately 833,000 AUM's by the fifth decade. This alternative ranks second lowest among all alternatives in the production of livestock forage.

Wildlife habitat, old growth, fisheries, and roadless recreation are addressed at comparatively moderate to high levels in this alternative. Provided capacity for elk is projected to decrease to 941 elk by the end of the fifth decade. This is a slight reduction from current estimated populations and ranks the alternative second highest. The provided capacity for deer is projected to increase to 27,200 by the fifth decade which is a projected increase of about 6,000 deer over current estimated populations. This ranks Alternative 8 fourth highest among all alternatives. By the end of the planning horizon, 80 percent of the suitable timber base is estimated to be classified as old growth. This is the highest among all alternatives. The fisheries potential for the Forest is projected at approximately 430,000 by the fifth decade. This is a very slight increase from the current estimated population and ranks the alternative lowest of the seventeen alternatives considered.

Visual quality would be protected and enhanced in Alternative 8 through the reduction in acres in EVC:4 Disturbed. By the end of the fifth decade, only 100,000 acres would be classified in EVC:4. This is the lowest of all alternatives and is primarily due to the reduction in the market outputs of oil and gas, livestock grazing, and fewer roads.

The management of the inventoried roadless areas would continue much the same as it has in the past under the various unit plans. Approximately 11,800 acres would be recommended for wilderness classification, and 114,700 acres would be managed for roadless or low development status. The roadless areas in North Dakota and Montana that have past surface occupancy cut-off dates in existing leases would be retained in a low development status. Oil and gas development could occur outside these areas and tap some of the reserve located under these areas through directional drilling. Other roadless areas in Montana would remain roadless subject to valid and existing rights of current mineral leases.

Approximately 608 miles of additional roads would be constructed in Alternative 8. By the end of the planning horizon the Forest would contain about 4,400 miles of system roads. This would be the lowest amount of roads projected in any of the alternatives.

Alternative 8 provides for an increase in Forest related private sector jobs in the first decade. However, a decrease of approximately 100 jobs from the 1980 base would occur in decade 2. A slight increase in local community returns would occur in decade 1 but would decrease in decade 2

below the 1980 base level. This ranks Alternative 8 the lowest of all alternatives in terms of local employment opportunity and returns to local communities.

The difference in PNV of Alternative 8 as compared to the Maximum PNV Benchmark is $2,021 million. This forgone value is the greatest of any alternative. It is due largely to significant reductions in market outputs of oil and gas, livestock grazing, and timber harvest.

In this alternative, the goal of following existing plans and continuing to produce current levels of commodity outputs can, in some instance, be accomplished with roughly current expenditures. As previously stated, livestock grazing would be significantly reduced over current permitted numbers and oil and gas production would be decreased. Existing wildlife and fisheries habitat potential will be maintained.

The major non-priced benefits of this alternative are protection of visual quality, and sustained moderate to high levels of wildlife. The primary tradeoff of managing under this alternative is an economic loss resulting from the reduced production of market outputs, and the reduction in local employment and returns.

20. Output Summary of the Alternatives

Table II-21 provides a comparative summary of the estimated resource production levels for the alternatives and for the Maximum PNV and Minimum Level Benchmarks. Outputs are generally shown for decades 1, 3, 5, and 7 and represent average annual values.

Table II-21 (Continued)
Major Data Table (Average Annual Outputs)

Resources	Unit of Measure	1980	Alternative/Benchmark																
	RPA														CM	Dep	PA	MAX	MIN
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10	PNV	LVL
Roadless management	M Acres	1983 = 265,920																	
	116.8	128.6	120.4	16.6	157.5	45.9	125.9	184.4	125.5	120.1	81.6	93.1	80.3	64.3	184.8	109.0	114.7	0.0	0.0
EVC-4 (Disturbed)	M Acres	1980 = 122																	
Decade 1	219	272	277	249	270	253	265	265	268	265	263	271	266	259	146	269	262	359	122
Decade 3	172	230	234	209	226	210	222	221	224	222	220	229	224	218	112	224	208	389	81
Decade 5	162	220	224	201	218	202	214	214	215	213	211	219	214	209	106	216	197	398	15
Decade 7	154	214	218	196	213	197	209	208	209	207	206	213	209	203	100	210	187	403	10
Wildlife habitat improvement	Acres	1980 Base = 75 Acres																	
Decade 1	1252	992	720	757	688	688	722	689	605	606	575	476	477	451	10	647	344	469	0
Decade 3	0922	1513	1368	1412	1136	1171	1206	1171	1002	999	969	726	725	576	60	1132	876	822	0
Decade 5	3914	1983	1764	1826	1447	1481	1584	1481	1362	1302	1241	927	927	902	100	1456	1408	1056	0
Decade 7	4749	2348	2088	2204	1722	1756	1860	1756	1604	1513	1453	1052	1077	1052	120	1715	1826	1244	0
Elk effective acres	M acres																		
Decade 1	461	444	437	451	447	448	441	441	450	438	447	436	439	445	453	448	441	439	455
Decade 3	468	447	446	451	446	450	450	449	448	448	449	448	447	446	441	447	440	447	445
Decade 5	465	447	451	449	451	450	449	450	448	448	450	447	447	447	439	446	438	451	443
Decade 7	465	447	448	450	448	450	448	448	447	448	449	448	447	449	439	446	438	449	443
Elk provided capacity	Elk	(1980 Base Year = 950 Elk)																	
Decade 1	1058	826	680	845	835	834	805	937	966	686	706	677	685	698	1042	845	972	684	1065
Decade 3	1072	792	676	809	785	804	804	925	890	686	689	681	678	676	941	797	917	681	997
Decade 5	1072	792	676	809	785	804	804	925	890	686	689	681	678	676	941	797	917	681	997
Decade 7	1072	792	676	809	785	804	804	925	890	686	689	681	678	676	941	797	917	681	997
Deer effective acres	M Acres																		
Decade 1	1598	1396	1457	1475	1421	1419	1414	1414	1431	1408	1411	1383	1386	1392	1431	1430	1466	1385	1560
Decade 3	2014	1414	1611	1617	1501	1500	1504	1506	1528	1495	1489	1411	1410	1408	1564	1527	1591	1541	1755
Decade 5	2019	1411	1616	1613	1508	1499	1503	1507	1528	1496	1491	1408	1407	1407	1564	1526	1590	1558	1756
Decade 7	2020	1412	1611	1613	1502	1498	1500	1503	1527	1494	1488	1408	1407	1409	1563	1526	1590	1556	1756
Deer provided capacity	M Deer	(1980 Base Year = 21,000 Deer)																	
Decade 1	30.2	23.4	23.8	25.5	24.0	23.9	23.7	26.0	24.7	22.5	22.6	21.9	22.0	22.1	26.5	24.2	27.7	22.1	29.6
Decade 3	36.9	23.2	26.1	27.4	24.8	24.9	25.0	27.2	25.9	23.7	23.6	22.0	22.0	22.0	27.2	25.4	29.3	24.5	31.9
Decade 5	36.9	23.2	26.1	27.4	24.8	24.9	25.0	27.2	25.9	23.7	23.6	22.0	22.0	22.0	27.2	25.4	29.3	24.5	31.9
Decade 7	36.9	23.2	26.1	27.4	24.8	24.9	25.0	27.2	25.9	23.7	23.6	22.0	22.0	22.0	27.2	25.4	29.3	24.5	31.9
Grouse effective acres	M Acres	(1980 Base Year = 202,000 Acres)																	
Decade 1	235	197	208	209	202	202	202	202	204	202	201	196	196	196	200	204	208	200	216
Decade 3	317	187	236	237	211	210	210	211	217	210	209	186	186	187	239	217	228	229	274
Decade 5	317	187	236	238	211	210	210	211	217	210	209	186	186	187	239	217	228	230	274
Decade 7	317	187	236	238	211	210	210	211	217	210	209	186	186	187	239	217	228	230	274
Old growth on suitable timberland in 75 years	%																		
	47	35	22	53	40	47	36	33	51	18	33	15	26	32	80	46	54	45	0
Fish habitat improvement	Acres	1980 Base = 0 Acres																	
Decade 1	28	22	24	26	24	24	25	24	24	24	22	22	22	21	3	24	24	21	0
Decade 3	66	34	45	28	39	40	41	40	41	39	38	34	34	27	6	41	41	40	0
Decade 5	88	45	58	62	49	51	54	51	53	51	48	44	44	42	10	53	53	53	0
Decade 7	107	53	68	75	59	60	64	60	62	59	57	49	51	49	15	62	62	62	0
Catchable Fish	M Fish																		
Decade 1																			
Streams	47.5	43.6	46.1	46.8	46.4	46.5	46.7	46.5	46.3	46.4	46.4	43.7	43.7	43.7	46.7	46.3	46.8	46.1	48.8
Warm Water	29.1	25.5	26.3	27.6	24.3	26.6	25.7	25.2	24.8	24.8	24.6	24.2	24.2	24.1	22.9	25.2	24.8	25.4	22.9
Lakes	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3
Total Decade 1	432.9	425.4	428.7	430.7	427.0	429.4	428.7	428.0	427.4	427.5	427.3	424.2	424.2	424.1	425.9	427.8	427.9	427.8	428.0
Decade 3																			
Streams	53.5	50.7	53.3	53.4	53.3	53.3	53.3	53.3	53.3	53.3	53.2	50.7	50.7	50.7	50.1	53.3	53.4	53.1	48.8
Warm Water	31.2	27.2	27.5	29.6	26.1	28.4	27.6	27.0	26.6	26.6	26.3	25.8	25.8	25.7	23.2	27.0	26.6	27.0	22.9
Lakes	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3
Total Decade 3	441.0	434.2	437.1	439.3	435.7	438.0	437.2	436.6	436.2	436.2	435.8	432.8	432.8	432.1	429.6	436.6	436.3	436.4	428.0
Decade 5																			
Streams	53.5	50.7	53.3	53.4	53.3	53.3	53.3	53.3	53.3	53.3	53.2	50.7	50.7	50.7	50.1	53.3	53.4	53.1	48.8
Warm Water	31.2	27.2	27.5	29.6	26.1	28.4	27.6	27.0	26.6	26.6	26.3	25.8	25.8	25.7	23.2	27.0	26.6	27.0	22.9
Lakes	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3
Total Decade 5	441.0	434.2	437.1	439.3	435.7	438.0	437.2	436.6	436.2	436.2	435.8	432.8	432.8	432.7	429.6	436.6	436.3	436.4	428.0
Decade 7																			
Streams	53.5	50.7	53.3	53.4	53.3	53.3	53.3	53.3	53.3	53.3	53.2	50.7	50.7	50.7	50.1	53.3	53.4	53.1	48.8
Warm Water	31.2	27.2	27.5	29.6	26.1	28.4	27.6	27.0	26.6	26.6	26.3	25.8	25.8	25.7	23.2	27.0	26.6	27.0	22.9
Lakes	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3
Total Decade 7	441.0	434.2	437.1	439.3	435.7	438.0	437.2	436.6	436.2	436.2	435.8	432.8	432.8	432.1	429.6	436.6	436.3	436.4	428.0
Potential livestock forage	M AUM	1980 Base = 875 M AUMS																	
Decade 1	827	902	887	887	896	896	896	896	894	899	900	906	906	916	878	893	865	884	0
Decade 3	704	954	881	881	902	902	902	902	896	916	917	957	957	957	813	896	858	880	0
Decade 5	728	973	898	898	920	919	919	919	913	933	934	977	975	975	833	914	875	899	0
Decade 7	721	973	899	899	920	920	920	920	913	934	935	977	976	976	833	917	875	898	0
Base timber sale schedule	MMBF	1980 = 1.5																	
Decade 1	3.5	2.2	4.4	3.4	4.1	6.7	6.7	6.7	4.0	8.4	6.7	6.0	6.0	6.0	4.0	3.1	3.0	0.0	0.0
Decade 3	3.5	6.6	9.1	7.1	7.1	6.8	7.0	7.0	4.0	8.4	7.2	8.7	7.1	6.3	3.2	8.0	3.0	17.3	0.0
Decade 5	3.5	8.8	9.2	7.6	7.0	6.8	7.0	7.0	4.0	8.4	7.2	11.2	9.6	10.0	3.2	6.5	3.0	15.9	0.0
Decade 7	2.6	8.0	6.0	5.0	7.0	6.8	7.0	7.0	4.0	8.4	7.2	7.4	6.3	6.6	3.2	4.1	3.0	5.5	0.0
Base timber sale schedule	MMCF	1980 = .33																	
Decade 1	1.0	0.6	1.3	1.0	1.2	1.9	1.9	1.9	1.1	2.4	1.9	1.7	1.7	1.7	1.1	0.9	0.9	0.0	0.0
Decade 3	1.0	1.9	2.6	2.0	2.0	1.9	2.0	2.0	1.1	2.4	2.1	2.5	2.0	1.8	0.9	2.3	0.9	4.9	0.0
Decade 5	1.0	2.5	2.6	2.2	2.0	1.9	2.0	2.0	1.1	2.4	2.1	3.2	2.7	2.9	0.9	1.8	0.9	4.5	0.0
Decade 7	0.8	2.3	1.7	1.4	2.0	1.9	2.0	2.0	1.1	2.4	2.1	2.1	1.8	1.9	0.9	1.2	0.9	1.6	0.0
Long-term sustained timber yield	MMBF	1980 = 10.4 MMBF																	
	7.4	12.8	10.6	6.4	8.2	7.0	8.7	9.0	6.7	11.0	9.0	11.4	10.1	9.1	2.5	7.4	6.4	9.2	0.0
Long-term sustained timber yield	MMCF	1980 = 2.97																	
	2.1	2.5	3.0	1.8	2.3	2.0	2.5	2.6	1.9	3.1	2.6	3.3	2.9	2.6	0.7	2.1	1.8	2.7	0.0
Reforestation natural	acres																		
Decade 1	374	206	523	306	499	751	751	751	397	755	332	545	665	587	398	388	340	000	000
Decade 3	136	000	421	578	290	103	332	365	129	601	508	405	428	246	163	720	149	1316	000
Decade 5	269	1122	1198	914	1016	984	1016	1016	406	883	670	1142	902	961	326	594	268	2266	000
Decade 7	55	696	656	664	284	825	768	735	93	1072	541	843	708	927	245	476	169	915	000

Table II-21
Major Data Table (Average Annual Outputs)

Resources	Unit of Measure	1980	Alternative/Benchmark																	
	RPA															CM	Dep	PA	MAX	MIN
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10	PNV	LVL
Developed recreation projection M RVD 1980 = 306 (includes the use in the following 4 categories)																				
Decade 1	400	442	450	427	462	466	455	461	448	445	388	439	412	417	368	449	433	450	361	
Decade 3	611	671	680	649	690	711	678	694	677	677	581	667	626	630	521	677	638	676	507	
Decade 5	662	730	745	705	750	766	758	757	734	740	634	732	687	687	559	734	686	723	538	
Decade 7	681	754	770	726	776	788	781	782	755	762	653	756	710	709	570	755	702	732	547	
Primitive recreation M RVD 1983 = 2.2 (First year of Recreation Opportunity Spectrum (ROS))																				
Decade 1	5.0	4.4	4.5	4.3	4.6	4.7	4.5	4.6	4.5	4.5	3.9	4.4	4.1	4.2	3.7	4.5	4.3	4.5	3.6	
Decade 3	6.1	6.7	6.8	6.5	6.9	7.1	7.0	6.9	6.8	6.8	5.8	6.7	6.3	6.3	5.2	6.8	6.4	6.8	5.1	
Decade 5	6.6	7.3	7.4	7.0	7.5	7.7	7.6	7.6	7.3	7.4	6.3	7.3	6.8	6.9	5.6	7.3	6.9	7.2	5.4	
Decade 7	6.8	7.5	7.7	7.3	7.8	7.9	7.8	7.8	7.6	7.6	6.5	7.6	7.1	7.1	5.7	7.5	7.0	7.3	5.5	
Semiprimitive nonmotorized recreation MRVD 1983 = 7.6 (First year of ROS)																				
Decade 1	12.0	13.3	13.5	12.8	13.9	14.0	13.6	13.8	13.4	13.4	11.6	13.2	12.4	12.5	11.1	13.5	13.0	13.5	10.8	
Decade 3	18.3	20.1	20.4	19.5	20.7	21.3	20.9	20.8	20.3	20.3	17.4	20.0	18.8	18.9	15.6	20.3	19.1	20.3	15.2	
Decade 5	19.9	21.9	22.3	21.1	22.5	23.0	22.7	22.7	22.0	22.2	19.0	22.0	20.6	20.6	16.8	22.0	20.6	21.7	16.1	
Decade 7	20.4	22.6	23.1	21.8	23.3	23.6	23.4	23.5	22.7	22.9	19.6	22.7	21.3	21.3	17.1	22.6	21.1	22.0	16.4	
Semiprimitive motorized recreation M RVD 1983 = 101 (First year of ROS)																				
Decade 1	155	172	176	167	180	182	177	180	175	174	151	171	161	163	144	175	169	175	141	
Decade 3	238	262	265	253	269	277	272	271	264	264	227	260	244	246	203	264	249	264	198	
Decade 5	258	285	290	275	293	299	296	295	286	288	247	286	268	268	218	286	268	282	210	
Decade 7	266	294	300	283	303	307	305	305	295	297	254	295	277	276	222	294	274	286	213	
Roaded Natural recreation M RVD 1983 = 152 (First year of ROS)																				
Decade 1	228	252	257	243	264	266	259	263	255	254	221	250	235	238	210	256	247	256	206	
Decade 3	348	382	388	370	393	405	398	396	386	386	331	380	357	359	297	386	364	385	289	
Decade 5	377	416	424	402	428	437	432	431	419	422	361	418	392	391	319	419	391	412	307	
Decade 7	388	430	439	414	442	449	445	446	431	434	372	431	405	404	325	430	400	417	312	
Wilderness recreation M RVD (included in Dispersed Recreation as Primitive)																				
Decade 1	223	305	207	273	211	262	235	219	206	217	215	234	209	227	190	308	206	205	175	
Decade 3	353	410	326	390	324	377	349	327	320	329	315	342	313	330	271	322	320	318	254	
Decade 5	407	452	376	437	370	421	392	371	366	372	355	379	354	372	306	367	366	361	289	
Decade 7	444	477	406	466	398	446	417	397	393	398	380	408	378	395	329	393	393	385	312	
Dispersed recreation projection M RVD 1980 = 450 (includes the use in the following 5 categories)																				
Decade 1	530	555	566	456	575	580	570	573	564	560	508	551	527	530	481	565	551	560	485	
Decade 3	915	851	902	874	891	907	896	895	885	877	790	841	805	806	706	885	872	876	712	
Decade 5	1092	983	1057	1021	1033	1042	1035	1039	1026	1020	923	975	936	834	920	1026	1015	1013	826	
Decade 7	1215	1067	1157	1116	1125	1128	1122	1130	1115	1108	1008	1058	1018	1016	894	1115	1110	1093	904	
Primitive recreation M RVD 1983 = 150 (First year in ROS)																				
Decade 1	148	155	158	153	161	162	160	161	158	157	142	154	147	148	135	158	154	157	136	
Decade 3	256	238	253	245	250	254	251	251	248	246	221	235	225	226	198	248	244	245	199	
Decade 5	306	275	296	286	289	292	290	291	287	286	258	273	262	262	230	287	284	284	231	
Decade 7	340	299	324	313	315	316	314	317	312	310	282	296	285	284	250	312	311	306	253	
Semiprimitive nonmotorized recreation M RVD 1983 = 30 (First year in ROS)																				
Decade 1	32	33	34	33	34	35	34	34	34	34	31	33	32	32	29	34	33	34	29	
Decade 3	55	51	54	52	53	54	54	54	53	53	47	50	48	48	42	53	52	53	43	
Decade 5	66	59	63	61	62	63	62	62	62	61	55	59	56	56	49	62	61	61	50	
Decade 7	73	64	69	67	68	68	67	68	67	66	60	63	61	61	54	67	67	66	54	
Semiprimitive motorized recreation M RVD 1983 = 102 (First year in ROS)																				
Decade 1	101	105	108	104	109	144	108	109	107	106	97	105	100	101	91	107	105	106	92	
Decade 3	174	162	171	166	169	172	170	170	168	167	150	160	153	153	134	168	166	166	135	
Decade 5	208	187	201	194	196	198	197	197	195	194	175	185	178	178	156	195	193	193	157	
Decade 7	231	203	220	212	214	214	213	215	212	210	191	201	193	193	170	212	211	208	172	
Roaded natural recreation M RVD 1983 = 176 (First year in ROS)																				
Decade 1	175	183	187	180	190	191	188	189	186	185	168	182	174	175	159	186	182	185	160	
Decade 3	302	281	298	288	294	299	296	295	292	290	261	277	266	266	233	292	288	289	235	
Decade 5	361	325	349	337	341	344	342	343	339	337	305	322	309	308	271	339	335	334	273	
Decade 7	401	352	382	368	371	372	370	373	368	366	333	349	336	335	295	368	366	361	298	
Rural recreation M RVD 1983 = 76 (First year in ROS)																				
Decade 1	74	78	79	76	80	81	80	80	79	78	71	77	74	74	67	79	77	78	68	
Decade 3	128	119	126	122	125	127	125	125	124	123	111	118	113	113	99	124	122	123	100	
Decade 5	153	138	148	143	145	146	145	145	144	143	129	137	131	131	115	144	142	142	116	
Decade 7	170	149	162	156	158	158	157	158	156	155	141	148	143	142	125	156	155	153	127	
Big game hunting M RVD 1980 = 53.5 (included in Dispersed Recreation)																				
Decade 1	64	60	61	61	61	61	61	61	61	61	60	59	59	59	56	61	61	59	60	
Decade 3	134	94	109	109	102	101	106	102	104	101	100	91	91	91	89	104	111	101	95	
Decade 5	181	122	143	143	133	132	132	133	136	132	130	119	119	118	117	136	147	135	125	
Decade 7	218	144	171	170	158	155	155	158	161	156	154	140	140	140	140	161	175	160	150	
Small game hunting M RVD 1980 = 15.3 (included in Dispersed Recreation)																				
Decade 1	18	17	17	17	17	18	17	17	17	17	17	17	17	17	16	17	17	17	17	
Decade 3	38	27	31	31	29	29	29	29	30	29	28	26	26	26	25	30	32	29	27	
Decade 5	52	35	41	41	38	38	38	38	39	38	37	34	34	34	33	39	42	38	36	
Decade 7	62	41	49	49	45	44	44	45	46	45	44	40	40	40	40	46	50	46	43	
Bird hunting M RVD 1980 = 27.1 (included in Dispersed Recreation)																				
Decade 1	42	39	40	40	40	40	40	40	40	39	39	39	38	37	40	38	40	38	39	
Decade 3	88	62	72	71	67	67	67	67	68	67	65	60	60	60	58	68	73	66	62	
Decade 5	119	80	94	94	88	86	87	88	89	87	86	78	78	78	77	89	96	88	82	
Decade 7	143	95	112	112	104	102	102	104	106	103	101	92	92	92	92	106	115	105	99	
Fishing use M RVD 1980 = 48.0 (included in Dispersed Recreation)																				
Decade 1	46	43	44	44	43	44	44	43	44	43	43	42	42	42	40	44	44	42	43	
Decade 3	96	67	78	78	73	72	73	73	74	72	71	65	65	65	63	74	79	72	68	
Decade 5	129	87	102	102	95	94	94	95	97	94	96	85	85	84	86	97	105	96	90	
Decade 7	156	103	122	121	113	111	111	113	115	111	110	100	100	100	100	115	125	114	107	
Nature study M RVD 1980 = 13.6 (included in Dispersed Recreation)																				
Decade 1	13	12	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	12	12	
Decade 3	27	19	22	22	20	20	20	20	21	20	20	18	18	18	18	21	22	20	19	
Decade 5	36	24	29	29	27	26	26	27	27	26	26	24	24	24	23	27	29	27	25	
Decade 7	44	29	34	34	32	31	31	32	32	31	31	28	28	28	28	32	35	32	30	
Wilderness management M Acres (In addition to 339,841 acres of A/B Wilderness)	129.0	0.3	0.0	241.7	0.0	182.0	93.5	11.0	11.8	36.6	105.8	9.8	47.6	105.3	18.8	9.8	11.8	0.0	0.0	

Table II-21 (Continued)
Major Data Table (Average Annual Outputs)

Resources	Unit of Measure	1980	Alternative/Benchmark																	
	RPA	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	CM 8	Dep 9	PA 10	MAX PNV	MIN LVL
Timber stand improvement	acres																			
Decade 1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decade 3		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Decade 5		0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0
Decade 7		0	0	0	0	0	0	0	0	0	99	93	16	0	0	64	0	0	0	0
Average annual runoff meeting water quality standards	(thousands of acre feet)																			
75 year average		1,040	1,048	1,042	1,041	1,041	1,040	1,040	1,041	1,041	1,041	1,041	1,048	1,048	1,048	1,045	1,041	1,041	1,041	1,026
Average annual runoff	(total in thousands of acre feet)																			
75 year average		1,080	1,100	1,092	1,090	1,091	1,090	1,089	1,091	1,090	1,090	1,091	1,100	1,100	1,099	1,095	1,090	1,090	1,090	1,070
Minerals management	M Cases																			
Decade 1		1.98	2.38	2.38	2.22	2.28	2.31	2.29	2.28	2.32	2.31	2.26	2.36	2.36	2.30	.98	2.32	2.14	2.55	.00
Decade 3		.29	.35	.34	.32	.34	.33	.34	.34	.34	.34	.32	.34	.34	.33	.14	.34	.31	.37	.00
Decade 5		.10	.12	.12	.11	.12	.11	.12	.12	.11	.11	.11	.12	.11	.11	.04	.11	.11	.12	.00
Decade 7		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Oil production forecast	M BBLS																			
Decade 1		13504	15664	15667	14586	15212	15108	15073	15025	15451	15293	12309	15647	15599	15171	8203	15454	14552	17589	8450
Decade 3		4588	4820	4825	4320	4615	4496	4577	7576	4665	4684	4579	4813	4758	4613	2195	4672	4341	7623	600
Decade 5		1016	1361	1360	1230	1342	1223	1317	1341	1296	1313	1289	1359	1347	1278	535	1298	1253	744	0
Decade 7		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Locatable minerals																				
Category A	M Acres																			
Low potential		247	221	221	288	221	269	239	221	231	231	248	231	252	251	235	238	231		
Moderate		147	100	99	147	100	145	116	99	99	99	139	99	105	126	128	99	99		
High potential		42	28	28	42	28	36	28	29	28	28	32	28	28	43	31	28	28		
Very high		1	0	0	1	0	1	0	1	0	0	0	0	0	1	1	1	0		
Category B	M Acres																			
Low		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Moderate		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
High		0	2	2	0	2	2	2	2	2	2	0	2	2	0	2	0	2		
Very high		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Category C	M Acres																			
Low		352	4	346	266	69	26	40	76	89	66	68	61	52	70	0	69	89		
Moderate		16	0	28	7	25	5	11	7	22	7	7	7	9	14	0	13	22		
High		4	0	8	2	6	2	3	3	9	3	2	1	3	3	0	3	9		
Very high		1	0	2	1	2	1	1	2	4	1	1	0	1	1	0	1	4		
Category D	M Acres																			
Low		358	731	389	403	666	662	677	660	637	660	640	665	633	635	721	649	637		
Moderate		3	68	40	13	43	17	39	61	46	61	21	61	53	27	39	55	46		
High		10	25	18	12	19	16	22	21	16	22	22	24	22	10	23	22	16		
Very high		5	7	5	5	5	5	6	4	2	6	6	7	6	0	6	6	2		
Leasable minerals																				
Category A	M Acres																			
Low		163	150	150	163	150	161	160	150	160	160	163	160	160	152	150	160	160		
Moderate		112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112	112		
High		185	78	78	203	78	168	104	80	78	78	144	78	105	139	124	86	78		
Very high		9	0	0	120	0	82	58	9	0	27	26	0	11	42	0	0	0		
Category B	M Acres																			
Low		2	12	12	0	12	2	2	12	2	2	0	2	2	10	10	2	2		
Moderate		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
High		16	0	0	0	40	17	40	40	40	40	40	0	28	28	39	40	19		
Very high		235	0	15	52	66	40	54	76	74	43	71	0	0	0	100	74	99		
Category C	M Acres																			
Low		122	30	32	29	39	35	44	28	30	31	34	31	35	30	29	30	30		
Moderate		85	10	70	68	12	14	12	15	15	13	13	12	14	14	6	15	15		
High		466	136	412	286	153	102	132	133	239	124	122	134	121	153	139	204	262		
Very high		782	316	345	243	264	242	264	263	307	245	289	319	311	311	279	315	293		
Category D	M Acres																			
Low		10	106	104	105	96	99	92	107	105	104	100	104	100	105	108	106	105		
Moderate		4	80	19	21	77	76	77	74	74	76	76	77	75	75	84	75	75		
High		254	706	430	431	649	633	645	668	563	678	614	708	666	601	618	590	590		
Very high		2	712	668	612	697	664	652	680	647	713	641	709	705	675	649	638	635		
Roads needed for management	Miles	1980 Base = 3803 Miles																		
		4447	5685	5685	4448	5098	5295	5273	5285	5203	5664	5628	5685	5678	5639	4400	5666	5650	5685	3803
Road construction timber (System Roads)	Miles																			
Decade 1		5.3	3.3	6.6	5.1	6.1	10.1	10.1	10.1	6.0	12.6	10.1	9.0	9.0	9.0	6.0	4.7	4.5	.0	.0
Decade 3		2.6	5.0	6.8	5.3	5.3	5.1	5.3	5.3	3.0	6.3	5.4	6.5	5.3	4.7	2.4	6.0	2.3	13.0	.0
Decade 5		1.8	4.4	4.6	3.8	3.5	5.1	3.5	3.5	2.0	4.2	3.6	5.6	4.8	5.0	1.6	3.3	1.5	8.0	.0
Decade 7		1.8	4.0	3.0	2.5	3.5	5.1	3.5	3.5	2.0	4.2	3.6	3.7	3.2	3.3	1.6	2.1	1.5	2.8	.0
Road construction timber (local or non-system roads)	Miles																			
Decade 1		1.0	.7	.7	.5	.8	1.1	1.1	1.1	.9	2.5	2.1	1.5	1.0	1.2	.9	.6	.5	.0	.0
Decade 3		1.4	2.9	1.7	1.5	2.3	2.5	2.5	2.7	1.7	2.9	2.2	3.3	2.6	2.3	1.0	1.5	.9	2.8	.0
Decade 5		.4	1.6	1.8	1.4	1.6	1.5	1.6	1.6	.6	1.3	1.0	1.7	1.4	1.5	.3	.9	.4	3.5	.0
Decade 7		.0	.6	.5	.7	.8	.2	.5	.7	.4	1.3	1.0	.6	.8	.8	.2	.6	.5	.9	.0
Road construction oil and gas	Miles																			
Decade 1		25.8	75.2	75.2	25.8	51.8	59.8	58.8	59.4	74.4	74.4	73.0	75.2	75.0	73.4	53.8	74.4	73.8	75.2	25.8
Decade 3		6.2	18.4	18.4	6.2	12.8	12.8	14.6	12.8	18.2	18.2	18.0	18.4	18.4	18.0	12.6	18.2	18.0	18.4	6.2
Local Forest-related employment	(Jobs over 4202 for base year 1980)																			
Decade 1		1980	3107	3310	2856	3107	3158	3125	3103	3120	3168	2994	3186	3094	2980	725	3105	2772	3747	-2071
Decade 2		795	1895	2150	1676	1887	1881	1922	1921	1849	1932	1642	1894	1775	1678	-89	1861	1566	1980	-2115
Local Forest-related income	MM$	(over $162 MM in base year 1980)																		
Decade 1		103	147	150	131	142	142	141	140	145	144	142	148	146	140	23	145	129	178	-106
Decade 2		24	58	61	42	54	50	53	54	54	56	48	58	55	49	35	54	41	59	-122
Budget	MM$ (1978 Dollars)	1980 Base = 4.6																		
Decade 1		7.1	6.8	7.1	7.1	7.1	7.6	7.7	7.4	7.1	7.7	7.3	7.3	7.1	7.1	4.5	7.0	6.7	6.9	1.4
Decade 3		7.1	8.1	7.7	7.5	7.6	8.0	8.2	7.8	7.2	7.9	7.5	8.6	8.2	8.1	4.4	7.4	6.9	7.9	1.4
Decade 5		7.2	8.2	7.8	7.7	7.7	8.0	8.2	7.8	7.2	7.8	7.5	8.5	8.2	8.2	4.3	7.3	7.0	8.4	1.4
Decade 7		7.3	8.4	7.7	7.7	7.7	8.1	8.2	7.9	7.3	8.1	7.6	8.6	8.4	8.7	4.3	7.4	7.1	7.5	1.4

Table II-21 (Continued)
Major Data Table (Average Annual Outputs)

Resources	Unit of Measure	1980																		
		Alternative/Benchmark																		
		RPA														CM	Dep	PA	MAX	MIN
		1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10	PNV	LVL
Recreation costs	MM$																			
Decade 1		.48	.44	.48	.50	.44	.56	.57	.50	.41	.47	.39	.47	.43	.43	.07	.44	.36	.47	.01
Decade 3		.74	.67	.72	.76	.67	.86	.88	.77	.63	.72	.59	.71	.66	.65	.09	.66	.55	.70	.02
Decade 5		.80	.73	.80	.83	.73	.93	.96	.84	.69	.79	.65	.78	.73	.71	.11	.72	.59	.76	.02
Decade 7		.82	.76	.83	.86	.76	.96	.99	.87	.71	.81	.67	.81	.75	.74	.11	.75	.61	.77	.02
Range costs	MM$																			
Decade 1		1.79	1.80	2.04	2.06	2.08	2.06	2.07	2.08	2.05	2.06	2.07	2.00	1.94	1.95	1.50	2.07	1.96	2.07	.00
Decade 3		1.54	2.58	2.03	2.05	2.09	2.07	2.08	2.09	2.07	2.18	2.19	2.75	2.72	2.72	1.48	2.08	2.06	2.02	.00
Decade 5		1.58	2.73	2.07	2.08	2.13	2.10	2.12	2.13	2.11	2.23	2.24	2.92	2.88	2.88	1.51	2.12	2.11	2.07	.00
Decade 7		1.58	2.74	2.07	2.08	2.14	2.10	2.12	2.13	2.11	2.23	2.24	2.92	2.88	3.18	1.51	2.12	2.11	2.06	.00
Timber costs	MM$																			
Decade 1		.34	.23	.30	.20	.29	.44	.44	.44	.32	.83	.64	.49	.39	.42	.31	.23	.21	.00	.00
Decade 3		.42	.90	.91	.60	.75	.83	.88	.91	.50	1.01	.77	1.01	.88	.77	.33	.59	.29	1.16	.00
Decade 5		.26	.74	.82	.61	.69	.67	.69	.69	.28	.67	.57	.77	.60	.64	.19	.40	.19	1.55	.00
Decade 7		.20	.79	.60	.45	.63	.68	.66	.70	.37	.91	.67	.79	.68	.73	.25	.35	.29	.54	.00
Wildlife costs	MM$																			
Decade 1		.25	.20	.20	.21	.20	.22	.23	.20	.21	.20	.20	.20	.19	.19	.04	.21	.19	.20	.00
Decade 3		.55	.31	.38	.39	.35	.37	.38	.35	.36	.34	.33	.30	.30	.29	.08	.36	.37	.35	.00
Decade 5		.74	.39	.50	.52	.45	.48	.49	.45	.46	.44	.42	.38	.38	.37	.10	.46	.48	.45	.00
Decade 7		.90	.46	.59	.60	.52	.57	.58	.53	.54	.51	.49	.45	.45	.44	.12	.54	.57	.54	.00
Other costs	MM$																			
Decade 1		3.77	3.61	3.61	3.67	3.63	3.84	3.88	3.64	3.60	3.62	3.57	3.64	3.61	3.59	2.35	3.61	3.56	3.59	1.35
Decade 3		3.77	3.61	3.61	3.67	3.63	3.84	3.88	3.64	3.60	3.62	3.57	3.64	3.61	3.59	2.35	3.61	3.56	3.59	1.35
Decade 5		3.77	3.61	3.61	3.67	3.63	3.84	3.88	3.64	3.60	3.62	3.57	3.64	3.61	3.59	2.35	3.61	3.56	3.59	1.35
Decade 7		3.77	3.61	3.61	3.67	3.63	3.84	3.88	3.64	3.60	3.62	3.57	3.64	3.61	3.59	2.35	3.61	3.56	3.59	1.35
Purchaser credit road costs	MM$																			
Decade 1		.11	.08	.09	.05	.09	.13	.13	.13	.10	.29	.24	.17	.11	.13	.10	.07	.06	.00	.00
Decade 3		.16	.33	.31	.17	.27	.28	.29	.31	.19	.33	.25	.37	.29	.26	.11	.17	.10	.32	.00
Decade 5		.05	.19	.21	.16	.18	.17	.18	.18	.07	.15	.12	.20	.16	.17	.04	.10	.05	.40	.00
Decade 7		.00	.07	.06	.08	.09	.03	.06	.08	.04	.14	.11	.07	.09	.10	.03	.06	.06	.10	.00
Range costs (RBF)	MM$																			
Decade 1		.14	.15	.14	.14	.15	.15	.15	.15	.15	.15	.15	.15	.15	.15	.14	.15	.15	.14	.00
Decade 3		.11	.16	.13	.13	.14	.15	.15	.14	.15	.15	.15	.16	.16	.16	.13	.15	.14	.14	.00
Decade 5		.15	.16	.14	.13	.15	.15	.15	.15	.15	.15	.15	.16	.16	.16	.14	.15	.15	.14	.00
Decade 7		.12	.16	.14	.13	.15	.15	.15	.15	.15	.15	.15	.16	.16	.16	.14	.15	.15	.14	.00
Range costs (CP)	MM$																			
Decade 1		.84	.92	.91	.91	.91	.91	.91	.91	.91	.92	.92	.92	.92	.92	.89	.91	.87	.91	.00
Decade 3		.72	.97	.92	.92	.93	.92	.92	.92	.92	.94	.94	.97	.97	.97	.83	.92	.87	.92	.00
Decade 5		.74	.99	.94	.94	.95	.94	.94	.94	.93	.95	.95	.99	.98	.99	.85	.93	.88	.94	.00
Decade 7		.74	.99	.94	.94	.95	.94	.94	.94	.96	.95	.95	.99	.99	.98	.85	.96	.88	.94	.00
Total capital investment costs	MM$																			
Decade 1		2.27	2.25	2.31	2.27	2.31	2.44	2.44	2.39	2.32	2.59	2.49	2.41	2.33	2.34	1.89	2.28	2.19	2.19	.00
Decade 3		3.35	3.50	3.53	3.37	3.38	3.48	3.51	3.46	3.27	3.52	3.36	3.58	3.46	3.40	2.48	3.27	3.15	3.15	.00
Decade 5		3.90	3.81	3.96	3.90	3.78	3.82	3.86	3.81	3.62	3.79	3.68	3.84	3.76	3.76	2.81	3.68	3.62	3.62	.00
Decade 7		4.32	4.00	4.15	4.16	4.02	3.99	4.03	4.05	3.94	4.13	4.01	4.01	4.00	4.04	3.13	3.97	4.01	4.01	.00
Operation/maintenance costs	MM$																			
Decade 1		2.36	2.27	2.39	2.38	2.39	2.55	2.57	2.47	2.37	2.57	2.46	2.43	2.37	2.37	1.50	2.36	2.26	2.30	.46
Decade 3		2.37	2.73	2.59	2.53	2.53	2.69	2.74	2.62	2.42	2.66	2.52	2.87	2.76	2.71	1.46	2.47	2.31	2.65	.46
Decade 5		2.40	2.76	2.62	2.59	2.57	2.70	2.73	2.61	2.40	2.60	2.50	2.85	2.75	2.75	1.43	2.46	2.33	2.51	.46
Decade 7		2.44	2.80	2.58	2.57	2.57	2.73	2.76	2.64	2.46	2.71	2.56	2.88	2.81	2.91	1.45	2.47	2.39	2.51	.46
Cash flow to U.S. Treasury	MM$																			
Decade 1		43.2	49.9	50.0	46.7	48.6	48.4	48.2	48.1	49.3	48.9	48.9	50.0	49.9	48.5	26.8	49.3	46.5	55.9	.02
Decade 3		15.5	16.8	17.0	15.2	16.2	15.7	15.8	15.9	16.0	16.4	16.0	16.8	16.6	16.1	8.2	16.5	15.0	17.2	.03
Decade 5		4.5	6.2	6.0	5.6	5.8	5.4	5.7	5.8	5.7	6.0	5.9	6.6	6.4	6.2	3.2	6.0	5.5	4.3	.03
Decade 7		1.3	2.0	1.7	1.6	1.9	1.8	1.8	1.9	1.6	1.9	1.8	1.9	1.8	1.8	1.5	1.7	1.5	1.7	.03
PNV of Federal Receipts @ 4%		626	723	725	668	704	693	696	697	708	708	701	725	719	699	379	711	661	764	14
PNV of Federal Receipts @ 7.125%		557	640	644	597	329	624	625	625	631	630	612	640	632	617	359	632	588	678	80
Cash flow to States	MM$																			
Decade 1		10.8	12.5	12.5	11.7	12.2	12.1	12.1	12.0	12.3	12.2	12.2	12.5	12.5	12.1	6.7	12.3	11.6	14.0	.01
Decade 3		3.9	4.2	4.2	3.8	4.0	3.9	4.0	4.0	4.0	4.1	4.0	4.2	4.1	4.0	2.1	4.1	3.7	4.3	.01
Decade 5		1.1	1.5	1.5	1.4	1.5	1.4	1.4	1.5	1.4	1.5	1.5	1.6	1.6	1.6	.8	1.5	1.4	1.1	.01
Decade 7		.3	.5	.4	.4	.5	.4	.4	.5	.4	.5	.5	.5	.5	.5	.4	.4	.4	.4	.01
Recreation cash flow	MM$																			
Decade 1		.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04	.03
Decade 3		.06	.06	.07	.06	.07	.07	.07	.07	.06	.06	.06	.06	.06	.06	.05	.06	.06	.06	.05
Decade 5		.06	.07	.07	.07	.07	.07	.07	.07	.07	.07	.06	.07	.07	.07	.05	.07	.07	.07	.05
Decade 7		.07	.07	.07	.07	.07	.08	.07	.07	.07	.07	.06	.07	.07	.07	.05	.07	.07	.07	.05
Oil cash flow	MM$																			
Decade 1		41.9	48.6	48.6	45.2	47.2	46.8	46.7	46.6	47.9	47.4	47.5	48.5	48.4	47.0	25.4	47.9	45.1	57.5	0.0
Decade 3		14..	14.9	15.0	13.4	14.3	13.9	14.1	14.2	14.5	14.5	14.2	14.9	14.7	14.3	6.8	45.8	13.5	14.3	0.0
Decade 5		3.2	4.2	4.2	3.8	4.2	3.8	4.1	4.2	4.0	4.1	4.0	4.2	4.2	4.0	1.7	4.0	3.9	2.3	0.0
Decade 7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Range cash flow	MM$																			
Decade 1		1.22	1.33	1.30	1.30	1.32	1.32	1.32	1.32	1.32	1.33	1.33	1.34	1.34	1.33	1.29	1.32	1.28	1.30	.00
Decade 3		1.01	1.41	1.29	1.29	1.33	1.33	1.33	1.32	1.32	1.35	1.35	1.41	1.41	1.41	1.20	1.32	1.27	1.29	.00
Decade 5		1.06	1.44	1.32	1.32	1.35	1.35	1.35	1.35	1.34	1.37	1.38	1.44	1.43	1.44	1.23	1.35	1.29	1.32	.00
Decade 7		1.06	1.44	1.32	1.32	1.35	1.35	1.35	1.35	1.34	1.37	1.38	1.44	1.44	1.44	1.23	1.35	1.29	1.32	.00
Timber cash flow	MM$																			
Decade 1		.06	.01	.11	.11	.10	.18	.18	.18	.09	.12	.12	.10	.17	.16	.09	.07	.08	.00	.00
Decade 3		.18	.45	.66	.47	.50	.41	.34	.40	.23	.46	.40	.48	.37	.37	.21	.64	.20	1.54	.00
Decade 5		.25	.48	.46	.45	.26	.25	.26	.26	.30	.52	.47	.86	.80	.81	.25	.54	.25	.59	.00
Decade 7		.16	.52	.39	.28	.48	.36	.40	.46	.24	.45	.43	.40	.33	.35	.22	.29	.17	.37	.00
Market resource benefits	MM$																			
Decade 1		208	236	242	225	235	241	240	239	237	245	240	244	246	239	136	236	223	258	25
Decade 3		85	100	110	97	100	96	97	97	90	105	100	107	101	97	52	107	83	142	2
Decade 5		37	62	62	56	54	52	54	54	46	61	56	74	69	69	30	56	42	73	2
Decade 7		19	37	30	29	34	33	34	33	25	39	35	35	32	32	22	26	22	30	2

Table II-21 (Continued)
Major Data Table (Average Annual Outputs)

Resources	Unit of Measure	1980	Alternative/Benchmark																	
		RPA														CM	Dep	PA	MAX	MIN
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10	PNV	LVL
Nonmarket resource benefits	MM$																			
Decade 1	6.8	6.6	6.7	6.6	6.7	6.8	6.7	6.7	6.7	6.7	6.4	6.5	6.4	6.4	6.0	6.7	6.7	6.5	6.3
Decade 3	13.8	10.2	11.8	11.6	11.1	11.0	11.0	11.1	11.2	10.9	10.5	10.0	9.9	9.8	9.4	11.2	11.8	11.0	9.9
Decade 5	19.0	13.9	16.0	15.8	15.1	14.9	14.9	15.1	15.2	14.9	14.2	13.6	13.4	13.4	12.6	15.2	16.1	15.1	13.3
Decade 7	22.4	16.0	18.7	18.4	17.4	17.1	17.0	17.4	17.6	17.1	16.4	15.6	15.4	15.4	14.7	17.6	18.7	17.4	15.5
Benefits discounted at 4%	MM$																			
Range	230	287	271	271	277	277	277	277	275	280	280	288	288	288	258	275	264	271	0
Minerals (oil)	3246	3715	3718	3402	3604	3524	3560	3569	3639	3622	3587	3711	3686	3571	1818	3673	3404	3857	244
Recreation	87	96	98	93	99	101	100	100	97	97	84	96	90	91	76	97	92	97	74
Wildlife	246	178	205	203	191	189	190	191	195	190	188	174	174	173	170	195	208	190	181
Timber	3.1	5.7	8.0	6.9	6.5	7.3	6.2	6.4	3.8	7.6	7.2	7.7	7.5	7.4	3.9	6.6	3.3	8.2	0
Costs discounted at 4%	MM$																			
Range	39.5	53.6	49.0	48.9	50.3	49.7	50.1	50.3	49.8	51.3	51.5	57.9	57.2	57.6	35.9	50.0	48.6	49.2	0.0
Minerals (oil)	5.0	6.0	6.1	5.6	5.8	5.8	5.8	5.8	5.9	5.9	5.7	6.0	6.0	5.8	2.3	5.9	5.4	6.5	0.0
Recreation	15.3	13.9	15.2	15.9	14.0	17.9	18.3	16.0	13.1	15.0	12.4	14.9	13.8	13.7	2.0	13.8	11.4	14.7	.4
Wildlife	11.4	6.7	8.0	8.3	7.4	8.0	8.1	7.4	7.6	7.3	7.0	6.6	6.5	6.4	1.7	7.6	7.8	7.4	0.0
Timber	9.0	14.0	14.9	11.0	12.1	14.0	15.8	15.9	9.9	20.5	15.2	18.8	15.4	14.3	7.7	10.5	6.1	10.3	0.0
Other	91.0	87.2	87.0	88.5	87.5	92.5	93.5	87.9	86.8	87.3	86.2	87.7	87.1	86.6	56.8	87.1	85.7	86.7	32.5
Benefits discounted at 7.125%	MM$																			
Range	137	165	157	158	160	160	160	160	160	162	162	165	165	165	152	160	154	157	0
Minerals (oil)	2336	2689	2691	2473	2609	2564	2580	2582	2640	2623	2605	2685	2670	2590	1339	2643	2462	2864	210
Recreation	47	52	53	51	54	55	54	54	53	53	46	52	49	49	42	53	50	53	41
Wildlife	121	93	104	102	98	98	98	98	100	98	96	91	91	90	88	100	105	97	94
Timber	1.5	2.1	3.8	3.2	3.1	3.7	3.1	3.2	1.8	3.6	3.5	3.2	3.6	3.5	2.0	3.0	1.7	3.2	0
Costs discounted at 7.125%	MM$																			
Range	24.1	29.7	29.1	29.0	29.9	29.5	29.8	29.9	29.9	30.2	30.3	32.1	31.8	31.9	21.4	29.7	28.6	29.3	0.0
Minerals (oil)	4.0	4.8	4.8	4.4	4.6	4.6	4.6	4.6	4.7	4.7	4.5	4.8	4.7	4.6	1.8	4.7	4.3	5.1	0.0
Recreation	8.3	7.6	8.3	8.4	7.6	9.7	8.9	8.7	7.1	8.1	6.7	8.1	7.5	7.4	1.1	7.5	6.2	8.1	0.2
Wildlife	5.6	3.5	4.1	4.2	3.8	4.1	4.2	3.8	3.9	3.8	3.6	3.5	3.4	3.3	0.8	3.9	3.9	3.8	0.0
Timber	5.4	7.1	7.5	5.5	6.2	8.0	8.7	8.8	5.8	12.4	9.0	10.3	8.1	7.8	4.7	5.4	3.5	3.8	0.0
Other	54.2	52.0	51.9	52.8	52.2	55.1	55.7	52.4	51.8	52.1	51.0	52.3	52.9	51.6	33.8	51.9	51.1	51.7	19.3
Present value benefits (4%)	MM$																			
	3812	4282	4300	3976	4178	4098	4132	4143	4210	4196	4146	4277	4246	4130	2327	4217	3972	4424	500
Present value costs (4%)	MM$																			
	171	181	180	178	177	188	192	183	173	187	178	192	186	184	106	175	165	175	33
Present net value (4%)	MM$																			
	3641	4000	4120	3798	4001	3910	3940	3959	4037	4009	3968	4085	4060	3946	2220	4042	3806	4249	467
Benefit/cost ratio (4%)	MM$																			
	22	24	24	22	24	22	22	23	24	22	23	22	23	22	22	24	24	25	15
Foregone econimic benefits (4%)	MM$																			
	608	149	130	451	249	339	309	290	212	240	281	164	190	303	2021	207	443	0	3782
Present value benefits (7 1/8 %)	MM$																			
	2643	3000	3009	2788	2925	2881	2895	2898	2954	2939	2912	2997	2978	2899	1623	2958	2773	3175	344
Present value costs (7 1/8 %)	MM$																			
	102	105	106	105	104	111	113	108	103	111	106	111	108	107	64	103	98	102	20
Present net value (7 1/8 %)	MM$																			
	2541	2896	2904	2683	2821	2770	2782	2790	2852	2828	2807	2886	2871	2792	1560	2855	2675	3073	325
Benefit/cost ratio (7 1/8 %)																				
	26	29	29	27	28	26	26	27	29	26	28	27	28	27	25	29	28	31	18
Foregone economic benefits (7 1/8 %)	MM$																			
	531	177	169	390	252	303	285	283	221	245	266	187	203	281	1513	218	398	0	2748
Research natural areas	Acres	1980 Base = 406 Acres																		
	2365	2365	2365	2365	2365	2365	2365	2365	2365	2365	2365	2365	2365	2365	2365	2365	2365	2365	2365
Forest work force	Work-year equiv. (Additional WYE above 1980 base of 224)																			
Decade 1	66	54	66	66	66	86	91	78	66	91	74	74	66	66	-40	62	50	58	-167
Energy consumption	Billion BTU																			
Decade 1	909	907	930	815	875	886	851	877	905	905	867	1092	908	891	481	904	892	942	162
Decade 3	361	411	433	394	417	416	410	417	413	415	374	422	410	406	287	418	409	467	226
Decade 5	328	227	366	354	368	373	366	373	364	364	322	362	350	350	267	359	361	350	000
Decade 7	320	483	535	351	354	355	349	354	347	348	304	355	334	507	262	348	344	332	000

CHAPTER III
AFFECTED ENVIRONMENT

CHAPTER III
AFFECTED ENVIRONMENT

Changes between the Draft and Final

A considerable amount of editing has taken place in this chapter and the minerals section in particular expanded. The oil and gas portion of the minerals section has been expanded to better display the actual situation and provide a better background for those reviewing the document. A number of terms used have been clarified to provide a better understanding.

This chapter describes the environment that may be changed by the implementation of the proposed action or alternative plans considered. This description is presented in two sections. Section A describes the physical, biological, and socio-economic setting, and Section B describes the Forest's current resource situation. Most of the resource discussion focuses on the non-wilderness portion of the Forest.

A. Physical, Biological, Social, and Economic Settings

1. General Setting

Lands under Custer National Forest management total 2,445,798 acres; 1,185,680 acres are proclaimed National Forest lands and 1,260,118 acres are National Grasslands. An additional 1,552,958 acres of non-Federal lands lie within the boundaries of these National Forest System Lands, making the gross area within the Forest's boundaries 3,998,756 acres.

TABLE III-1
LAND STATUS

National Forest Proclaimed lands	1,185,680 acres
National Grasslands	1,260,118 acres
Non-Federal Within Boundaries	1,552,958 acres
Gross Area	3,998,756 acres
Net National Forest System lands	2,445,798 acres

These lands lie within 20 counties in Montana, North Dakota and South Dakota (see Table III-3). They are scattered from the northeast corner of Yellowstone National Park in Park County, Montana, to Richland County in the southeastern corner of North Dakota. The south-westernmost portions are at the Montana-Wyoming line near Red Lodge, Montana. It is this portion of the Custer that is considered to a part of the Greater Yellowstone Area. These lands and others lying in extended areas around Yellowstone National Park all function in an interrelationship to each other. The Denbigh and Souris purchase units east of Minot, North Dakota, are the farthest north. The portions of the Forest in South Dakota extend as far east as Corson County, east of the town of Lemmon. Distances involved are about 240 miles north-to-south and 650 miles east-to-west.

The present Custer National Forest includes lands that, at one time or another, were in 15 Forest Reserves or earlier National Forests, plus four National Grasslands areas.

When the first Forest Reserves, and later National Forests, were established in the forested areas, the lands were withdrawn from the Public Domain. In contrast, the lands in the present National Grasslands were removed from public domain in various ways including homesteading and railroad grants. Because of the broken and scattered land ownership pattern, there are parcels of public lands that are accessible only by crossing private lands. As a result, public access to public lands is one of the Forest issues considered in this document.

The 1851 Fort Laramie Treaty assigned the major part of eastern Montana and western North and South Dakota to various Indian Tribes. Through the last half of the 1800's, those Indian lands were drastically reduced by cedings and purchases resulting in the present-day reservations.

Settlement in the Mountain Province saw the early trappers and fur traders give way to hard-rock miners and associated timber operations. In the mid-1870's, the ranchers started moving into the area and began grazing livestock on the open range with little control. Few communities developed until after the railroads reached Montana Territory in 1881. Even then, the lands that soon became the present Custer National Forest were not on major rail lines.

Today, the Beartooth District is essentially a farming/ranching area, along with recreation attractions and continuing hardrock mineral activity. The Ashland and Sioux Districts are largely ranching areas with some timber harvesting. Considerable mineral leasing has occurred, but there is little to no production at this time.

In the Prairie Province, the control of the lands was bitterly contested by the Indians for many years. Some early settlement occurred near the many frontier forts, but significant settlement came only as the railroads pushed across the northern Great Plains. Starting in 1871 from Fargo, North Dakota, near the Sheyenne District,

Custer National Forest
Ranger Districts

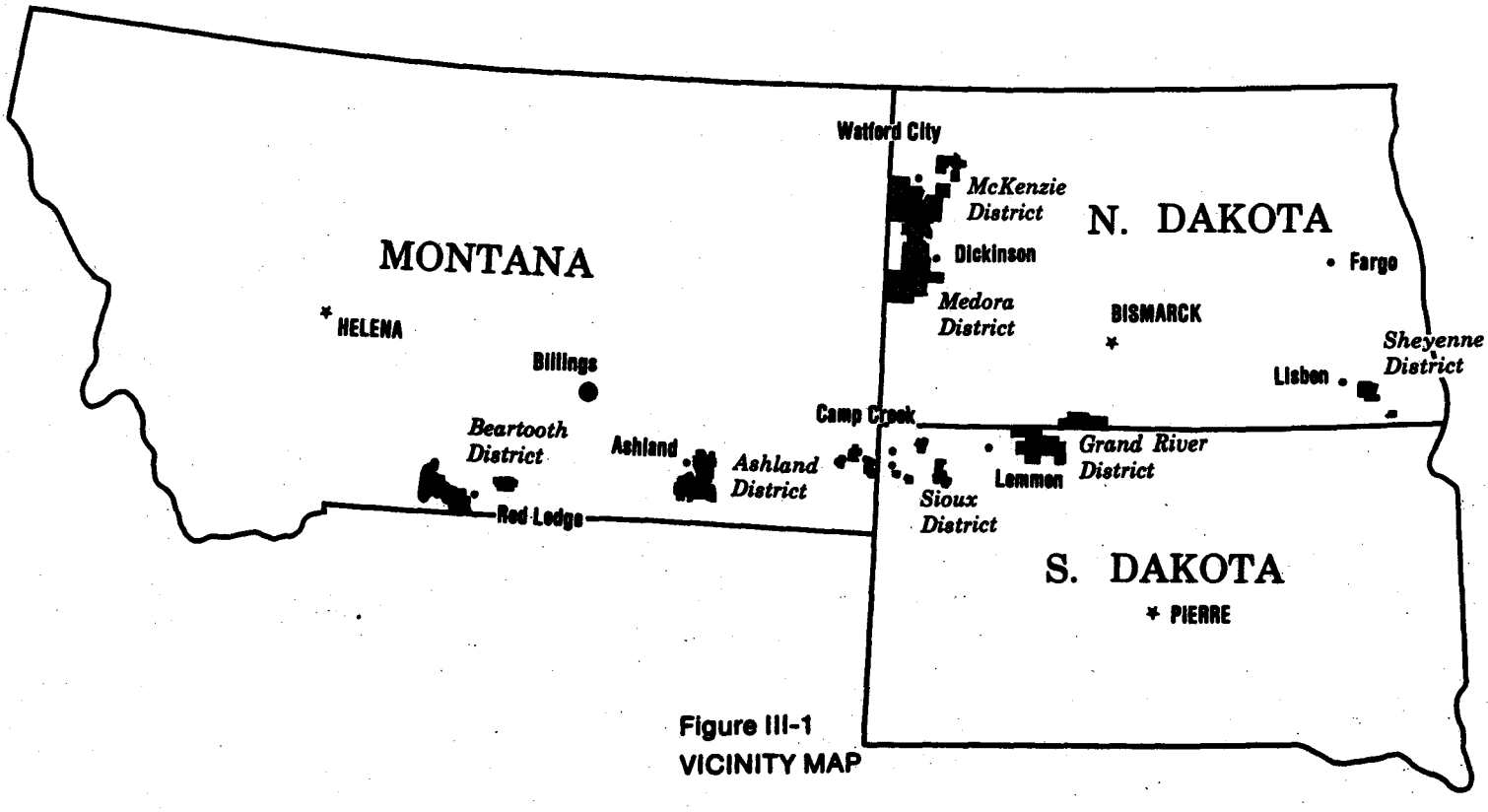


Figure III-1
VICINITY MAP

it took 10 years for the rails to reached the Montana Territory line. This delay was because of "Indian troubles." The vicinity of the Grand River District in northwest South Dakota was the last to be settled. The railroad did not reach Lemmon, South Dakota, until 1907. Development of the Medora and McKenzie District areas of North Dakota kept pace with the building of the railroad.

Except for the final Indian Reservation lands, nearly all of western North Dakota and the northwest corner of South Dakota became public domain land. It then passed by various means into private or corporate ownership in the short time between 1865 to 1920.

The settlers on these lands were largely of northern European and Russian heritage, and brought with them the agricultural practices of their homelands and of the eastern and central U.S. areas. For many years, there was no recognition of the environmental limitations of the semi-arid prairie lands and of the arid Badlands. The intensity of the traditional grazing and cropping practices that relied upon a humid climate was beyond the ability of the land to withstand. The accumulated effects of such practices from about 1910 to the early 1930's were disasterous. The land became tax delinquent and in poor condition from the combination of agricultural practices and severe climatic and insect situations.

Under the Bankhead-Jones Farm Tenant Act of 1937, many thousands of acres were purchased by the federal government. They were administered by various agencies and when finally assigned to the Forest Service in 1953 were integrated into local private ranching operations by means of Grazing Associations.

Today the Prairie Province is largely ranching land with limited cropping. A permit system with the Grazing Associations allows ranching operations across the intermingled public and private land. In extensive areas of the Little Missouri National Grasslands, and to a lesser extent in the Grand River/Cedar River National Grasslands, oil and natural gas exploration and production have boomed in the last 4 years, and now are a major part of this area's economy.

2. Physical Setting

a. Topography

The Custer National Forest contains a wide variety of geologic settings, ranging from the igneous-metamorphic rocks of the Beartooth Mountains, to deep sedimentary basins, to areas of continental glaciation. Elevations range from 905 feet above sea level in the eastern end of the Forest to 12,799 feet above sea level in the west end of the Forest.

The Sheyenne National Grassland is located beyond the eastern border of the Williston Basin in eastern North Dakota overlies the Sheyenne Delta. This land was deposited as the Sheyenne River flowed into ancient glacial Lake Agassiz. The average elevation on the Sheyenne is about 1,050 feet above sea level and there are only a very few places more than 50 feet higher or lower than that.

The Grand River and Cedar River National Grasslands in North and South Dakota are located on the southeastern portion of the Williston Basin and overlie approximately 10,000 feet of sedimentary formations. Surface formations consist of the Ludlow and Cannonball members of the Fort Union Group which is Paleocene in age.

The Little Missouri National Grassland in western North Dakota is located in the south-central portion of the Williston Basin and overlies approximately 14,000 feet of sedimentary formations. The formations exposed at the surface consist of the Golden Valley (Paleocene-Eocene), the Sentinel Butte, and the Bullion Creek (Paleocene) formations.

The Sioux Ranger District in South Dakota and Montana is located on the southwest portion of Williston Basin and near the Miles City Arch. The District is composed of a group of erosion remnants made up of buttes left standing above the surrounding land surface. Exposed at the surface are mainly the Ludlow and Cannonball formations.

The Ashland Ranger District in Montana is composed of the Tongue River member of the Fort Union Formation. It consists of nearly level bedded, weakly consolidated sandstones, silty sandstones, clayey shales, lignite beds and porcellanite (locally called scoria) and clinker beds. This District is located in the north-central portion of the Powder River Basin.

The Beartooth Ranger District in Montana contains the Beartooth and Pryor Mountains. The Beartooth Mountains are a massive block of Precambrian crystalline rock, including the Stillwater Complex, that was thrust up through and over about 11,000 feet of Paleozoic-Mesozoic sedimentary rock with subsequent faulting and folding.

b. Climate

The climate of the Custer National Forest is Continental, which means that summers are short and hot and winters are long and cold. Temperature extremes are also broadened by great elevation differences. Temperature regimes range from temperate to subartic. Moisture regimes vary from subhumid to semi-arid.

Precipitation generally rises on Districts farther east from the mountains; the Sheyenne National Grasslands receive more precipitation and its ambient relative humidity is much greater than on the higher plains of eastern Montana and western Dakotas. Mountainous areas of the Beartooth

District are an exception in that annual precipitation in some areas exceeds 70 inches.

c. Visual Setting

The landscape and its components that make up the visual resource of the Custer National Forest span five landscape character types within Montana, North Dakota, and South Dakota. These types are called Yellowstone Rockies, Rocky Mountain Foreland, Big Dry, Middle Missouri, and Red River, and are described in the USFS, R-1 Publication, *Visual Character Types and Variety Class Descriptions*.

The National Forest system lands range from the lush, tall-grass prairie of eastern North Dakota, across the dry, short-grass prairies and awesome badlands of western North Dakota, and on westward to the islands of pine in a sea of grass in northwest South Dakota and southeastern Montana. From there west, the mountains and the associated vegetation and landform seem to grow and grow until the 10,000 plus foot Beartooth Mountains appear. With such drastic and extreme differences in landform, vegetation, rock form, and waterforms, it is nearly impossible to draw any conclusions regarding the quality or quantity of any one landscape.

The existing visual condition (EVC) of the Custer National Forest is generally classified Untouched, Unnoticed, or Minor Disturbance (Classes 1, 2, and 3, respectively). However, in 1980 122,189 acres, or roughly 5 percent of the Forest was classified as EVC class 4 — Disturbed. It is this class of disturbance that is monitored through Forest planning. See Appendix B, The Forest Planning Model section for an explanation of the process. For the most part, management activities to date have not been to a scale that the impacts have dominated the natural landscape. The greatest existing visually impacted areas at present are the oil fields on the Little Missouri National Grassland. The existing visual conditions for parts of these areas have been ranked into the Classes of 4 and 5, Disturbed and Major Disturbance. In the long run, these area are not expected to remain in these classes, because the lands will most likely return to Class 3, Minor Disturbance, as the production of the fields draws to an end and rehabilitation begins.

d. Soils

The lands administered by the Custer National Forest have a great variety of soils. The variation should be expected in view of the distances and diverse areas represented. Surface materials range from coarse glacial till and scoured bedrock in the Beartooth Mountains to finer textured silty and clayey soils in eastern Montana and the western Dakotas. Sandy glacial outwash soils occur on the Sheyenne National Grassland in eastern North Dakota.

Mean annual soil temperatures range from about 50 degrees Farenheit on the warmest sites down to 30 degrees Farenheit or lower on permafrost soils of the high Beartooth Mountains. Moisture regimes vary from permanently saturated (aquatic) organic soils to near-desert (aridic) soils which are dry for more than half the year. Most are in intermediate categories.

Silty and clayey soils with moderate to strong horizon development are typical of most of the land from the Pryor Mountains eastward to the National Grasslands of the western Dakotas. Wind erosion is a problem on much of the National Grasslands, particularly in the Sheyenne National Grassland with its light sandy soils. Some wind erosion has occurred on alpine portions of the Beartooth Mountains. The Badlands exhibit rapid rates of natural geologic erosion. Large volumes of runoff generate unusually large volumes of sediment there because of poor infiltration and the lack of vegetative cover.

More than 90 percent of the Custer National Forest is mapped and published in Soil Surveys by the National Co-op Soil Survey. The Forest soils are identified as being within six of the ten World Soil Orders. It is likely there are also small undocumented units of Vertisols, which would leave only three Orders unrepresented. Geologic parent material influenced by landforming processes over a period of time have created surface soils in the Orders listed in Table III-2.

Certain soil families and series within these Orders are more susceptible to damage than others. For example, on the Beartooth District, the high altitude soils are slow to recover following disturbance and thus require considerable care for any type of use, even for wilderness recreation uses. The Pryor Mountains in the same Ranger District are generally quite stable, but soils formed in parent material of the Chugwater Formation are hard to protect because they often support only sparse vegetative and they are difficult to revegetate.

The Ashland, Sioux, and Grand River Ranger Districts have fairly large acreages of claypan soils and some badlands. The clayey surface means they have poor infiltration rates and are erosive when denuded. Underlying material is siltstone or shale which weathers to create the fine textured surface soils.

The Little Missouri National Grassland (Medora and McKenzie Ranger Districts) has the majority of badlands managed by the Forest. Much of the area is steep, erosive, and lacking in vegetative cover. These soils are also weathered from fine textured sedimentary deposits which makes them quite impermeable and creates a surface erosion hazard.

TABLE III-2
LANDFORMING PROCESSES AND RESULTANT SURFACE SOILS

Ranger District	Soil Orders Represented	Parent Material	Landforming Processes
Sheyenne	Mollisols, Entisols	Lacustrine sands of fluvio-glacial origin	Lacustrine deposition and recent wind shaping
Beartooth	Mollisols, Entisols, Inceptisols, Alfisols, Histosols	Granitic and sedimentary bedrock, granitic till and fluvio-glacial outwash	Glacial scour, fluvio-glacial deposition, frost cryoplanation, pluvial degradation
Sioux	Mollisols, Entisols, Aridisols, Alfisols	Sedimentary bedrock, fluvial deposits	Pluvial degradation, fluvial deposition
Ashland	Mollisols, Entisols, Aridisols, Alfisols	Sedimentary bedrock, fluvial deposits	Pluvial degradation, fluvial deposition
Grand River	Mollisols, Entisols, Aridisols, Alfisols	Sedimentary bedrock, few fluvial deposits	Pluvial degradation, fluvial deposition
Medora and McKenzie (Little Missouri Nat. Grasslands)	Mollisols, Entisols Inceptisols	Sedimentary bedrock, some fluvial deposits, some glacial till	Pluvial degradation (active and rapid (in badlands), fluvial deposition.

The Sheyenne Ranger District has sandy soils and gentle slopes which minimize the hazard of surface erosion. The greater hazard here is wind erosion.

Table III-2 shows the landsforming process and resultant surface soils for each of the Ranger Districts on the Forest.

3. Biological Setting

The Custer National Forest has characterized its lands and stratified their capabilities on the basis of ecosystems. Previous to this Forestwide planning effort, the ecosystems were mapped and described for all the lands except the Grand River and Cedar River National Grasslands. During this planning procedure, the ecosystems were also described for those two National Grasslands that make up the Grand River District.

Ecosystems consist of a complex of living and nonliving components, each interacting with the others to function as an integrated system or unit. While each of the individual components, (i.e., soil, plants, water, micro-organisms, and wildlife species) has its own significance, it is the combined effect of all and the interactions among them that are important. It is the total complex rather than the individual components that governs production possibilities and limitations, defines technical problems, and determines the appropriate types and intensities of uses of the area by man.

The environment on the Custer National Forest has been evaluated on the basis of grouped ecosystems. The ecosystems were described and delineated on the basis of landforms, topographic characteristics, and vegetative types. In order to create a manageable number of land units for this analysis, the ecosystems were grouped on the basis of capabilities for the types of land uses that occur in the areas. These ecosystems and ecogroups are defined in the Appendix B.

Federal regulations (36 CFR 219.14g) require that the planning process "provide for and maintain diversity of plant and animal communities and tree species consistent with the overall multiple-use objectives of the planning area..." The varied nature of the vegetation on the Forest dictates that more than one measure of diversity be used. There are four areas where management activities are likely to impact diversity: (1) timbered stands, (2) fire related ecosystems, (3) riparian/woody draw zones, and (4) grasslands (residual bird nesting cover). Baseline information is available for the timber stands only, but a qualitative evaluation can be made for the other three categories. These are covered briefly below, followed by a single summary of expected changes.

a. Timber Stands

The distribution and abundance of age classes of timber stands affects diversity. Maximum diversity occurs when all age classes are equally

represented and evenly distributed throughout the Forest. Under most management options, old growth, and dog hair (dense stands of young trees) stands are the classes most likely to be affected. Past fire occurance and fire management also play important roles in stand diversity, as described below.

b. Fire Related Ecosystems

Prior to the 1900's, fire was a recurring part of the Forest's natural environment. All vegetative communities were subject to burning under varying frequencies. Since the early 1900's, fire prevention and suppression has altered the natural environment somewhat. Two types of fire related ecosystems occur on the Forest: 1) Fire Dependent and 2) Fire Related.

1) Fire Dependent

The lodgepole pine association is the primary fire dependent ecosystem on the Forest. The cones of this species require intensive heat to open and disperse the seed. Fire prevention has allowed these stands to become mature and overmature with a greater risk of a major conflagration.

Aspen is not as fire dependent as lodgepole pine, but it does respond well to a catastrophic event such a fire. Stands of aspen are not extensive on the Forest. However, exclusion of fire has allowed the pine to close out these stands, and the acreage in aspen has been substantially reduced over the recent years of intense fire suppression.

2) Fire Related

All ecosystems are fire related to some degree. Only those ecosystems that have been strongly related to fire are included here. Ponderosa pine, Douglas-fir, and subalpine timber types can be categorized as strongly fire related. These ecosystems may not necessarily depend on fire for perpetuation, but fire has been an important part of their life history. The exclusion of low to moderate intensity ground fires has permitted the development of stagnant stands with dense understories. Prairie fires were also common in the natural grassland ecosystems and the lack of fire has resulted in changes in plant composition and allowed considerable tree encroachment.

c. Riparian/Woody Draws

The management of the riparian/woody draw areas is an issue on the Custer National Forest, particularly because these areas are valuable to both livestock and wildlife. Over the last 15 years, a number of studies have indicated a decline in the quality and acreages of the hardwood draws. Research is being conducted to establish a classification system which will allow a quantification of effects on these important areas. In the interim, a qualitative evaluation has been made of changes which may be caused by the application of different management alternatives, and efforts have been initiated to prevent further adverse impacts.

d. Residual Nesting Cover

Residual nesting cover is a critical element in the life of the prairie grouse. Research indicates that it is the most common limiting factor in the populations of these species. Both sharptail grouse and prairie chicken use the same general habitat, and both species are on the North Dakota list of high-interest wildlife. Baseline information is not available for this element, but some known factors that influence nesting cover are the percent of forage utilization, the range management system, and the season of livestock use. While a theoretical maximum condition may exist, the change from the present condition is the evaluation criteria for the alternatives.

4. Demographic, Social, and Economic Characteristics

(References: *Social and Economic Background Report*, Custer National Forest Plan, August, 1981, and *F.Y. 1983 Payments to Counties and States Under 7 Federal Land Laws for All Federal Lands Within the 22 Counties Containing Land Administered by the Custer National Forest*, April 1984)

a. Population

The lands of the Custer National Forest and of the National Grasslands administered by the Custer National Forest occur in 20 counties of Montana, North Dakota, and South Dakota. Another 10 adjacent counties are within the zones of local influence of the Custer National Forest lands. These 30 counties are referred to as zone counties. In two other counties, the Custer National Forest administers small minersl acreages but no surface acreage, and these two are not considered here.

As shown by the demographic data in the following table, the total populations of these 30 counties in the 1980 census was 394,505. Of this total, 42 percent people were in the two metropolitan counties (Yellowstone County, Montana, and Cass County, North Dakota). Twenty-two of these counties have populations of less than 10,000 and 16 of those have populations of 5,000 or less. Thus, a "typical" zone-of-influence county has a population of about 7,000, with a county seat of perhaps 1,700, with various small settlements of between 40 and 800 people, and a rural population of about 3,000.

Between 1960 and 1970 the population of many rural counties decreased as larger farm equipment became more common and farm size increased. A number of the counties largely dependent on agriculture continued to decline, but counties experiencing energy development or experiencing growth as regional market cen-

TABLE III-3
POPULATION DATA BY DECADE

COUNTY	STATE	POPULATION 1960	1970	1980
Beartooth District				
Yellowstone	MT*	79,016	87,367	107,661
Carbon	MT	8,317	7,080	8,099
Park	MT	13,168	11,179	12,660
Stillwater	MT	5,526	4,632	5,598
Sweetgrass	MT	3,290	2,980	3,216
Sioux District				
Carter	MT	2,493	1,956	1,799
Harding	SD	2,371	1,855	1,700
Ashland District				
Big Horn	MT*	10,007	10,057	11,083
Powder River	MT	2,485	2,862	2,520
Rosebud	MT	6,187	6,032	9,899
Sheyenne National Grassland (Sheyenne Ranger District)				
Cass	ND*	66,947	73,683	88,247
Ransom	ND	8,087	7,102	6,698
Richland	ND	18,824	18,089	19,207
Cedar River National Grassland (Grand River Ranger District)				
Adams	ND*	4,449	3,832	3,584
Grant	ND	6,248	5,009	4,274
Sioux	ND	3,662	3,632	3,620
Corso	SD	5,798	4,994	5,196
Perkins	SD	5,977	4,769	4,700
Zieback	SD	----------	no data	----------
Little Missouri National Grasslands (Medora District)				
Billings	ND	1,513	1,198	1,138
Golden Valley	ND	3,100	2,611	2,391
Slope	ND	1,893	1,484	1,157
Stark	ND*	18,451	19,613	23,697
Bowman	ND*	4,154	3,901	4,229
Dunn	ND*	6,350	4,895	4,627
Fallon	MT*	3,997	4,050	3,763
Little Missouri National Grasslands (McKenzie District)				
McKenzie	ND	7,296	6,127	7,132
Williams	ND*	22,051	19,301	22,237
Richland	MT*	10,504	9,837	12,243
Denbigh-Souris Purchase Units				
McHenry	ND	11,099	8,977	7,858

*Zone of influence counties, not containing any National Forest system lands.

ters generally have increased in population. Overall, the population of the 43 towns and cities cited in the original report grew 13.4 percent in the 1970-1980 period. Population increased in 29 towns and cities and decreased in the remaining 14.

The 1990 population projection made in the cited report assumes a continuation of three trends: (1) additional growth in counties experiencing significant oil, natural gas, and coal development; (2) modest growth of counties serving these energy-producing counties as wholesale, retail, and service centers; and (3) modest growth of the counties in the Beartooth District due to the retirement amenities they offer, the recreational opportunities, and possibly the hardrock mining activity that is again increasing.

b. Lifestyles

The population is largely rurally oriented, with strong ties to the land and to the many small towns. In both of the metropolitan counties Yellowstone County containing Billings, Montana, and Cass County containing Fargo, North Dakota the populations are roughly 65 percent urban and 35 percent rural.

Ranch and farm families constitute 25 percent or more of the populations of 17 zone counties. These long-time residents exert considerable political and economic influence, and tend to favor traditional land uses and the preservation of intergenerational family operations. They generally have a reluctance to see short-term developments that will alter their lifestyle.

Another 25 percent or more of the populations in a majority of the counties are long-established small town residents. These people generally wish to retain their way of life, but at the same time many of them seek to find compromises between their current situation and gradual development.

Another 10 percent of the populations outside of the two metropolitan counties are Native Americans, and largely are residents of five different Indian reservations in or near the zone counties. These groups generally desire to preserve many elements of their heritage and do not wish to become homogenized into and by the non-Indian culture. In recent years, significant strides have been made to utilize the reservation resources (particularly coal, oil, timber, and natural gas) for the long-term social and economic betterment of tribal members. They are cautiously welcoming energy-resources developments.

In recent years, the areas of major mineral activity have seen an influx of people from other areas. Many of these people regard their employment as temporary, expect to move on to other areas, and usually do not play an integral part in community affairs. The long-term local residents often resent these "outsiders" while at the same time often benefiting economically from the business and service demands of these newcomers.

Another distinct group is a small but growing population of professionals, craftsmen, retirees, and others who have moved to small towns (particularly in the forested counties) to enjoy the slower pace of life and various amenities. These people often participate in opposition to development proposals which appear to jeopardize the quality of their new lifestyle.

Lastly, the two metropolitan counties (Yellowstone County, Montana, and Cass County, North Dakota) are growing areas, with a wide diversity of business, manufacturing, transportation, medical, educational, and cultural components, as well as significant agricultural components outside of the immediate metropolitan areas. The populations of these two cities are cosmopolitan when compared to the rural areas and smaller towns, and have attracted people from many parts of the Nation. The people of these cities view the National Forest and National Grasslands primarily as valuable recreational areas rather than as integral parts of their economies, and frequently exhibit support for environmental protection aspects of land development.

There are seven Native American reservations near various parts of the Forest. Reservations by state are as follow: Montana; Crow, Northern Cheyenne, and Fort Peck, North Dakota; Fort Berthold, Standing Rock, Sisseton, South Dakota; Standing Rock (also in North Dakota, and Cheyenne.

No single social profile stands out because of the vast areas and the diversity in resources and people of the zone counties. However, the overall attitude concerning resource development is that of desiring to see gradual development, but with significant attention paid to maintaining environmental quality. Further, there is widespread concern that the States, counties, and small towns reap some of the financial benefits of development, in order to meet the associated social costs of such developments.

c. Economy

In the majority of the zone counties, agriculture and its related support services are the primary economic base. A few counties are experiencing high oil, natural gas, and/or coal development. However, their agricultural activities are still the long-term bases of their economy. The two metropolitan counties have business, manufacturing, professional services, and other economic foundations, as well as the agricultural components.

The average 1981 per capita income of people in the 26 rural zone counties for which complete data were available was $9,585, compared to the average of $9,495 for the three states (Montana, North Dakota, and South Dakota), and the average of $10,766 for the two metropotitan counties. However, when one converts the 1973 and 1978 per capita data into 1981 constant dollars, the changes reveal a general trend that indicates that per capita income increases are not keeping pace with inflation.

Considering these 26 rural counties and converting all available data to 1981 dollars, the 1973 to 1978 changes show only three counties with per capita gains, and 23 counties with losses. The 1978 to 1981 data reverses that trend with 18 counties showing gains and eight showing losses.

Table III-4 shows the average income by county grouping for the years 1973 through 1981.

d. Forest Receipts

Forest receipts by resource for 1979 through 1983 by selected years are shown in Table III-5.

The future economic situation for most of the zone counties will continue to be dependent on the stability of the agricultural base. For the counties producing oil, natural gas, and coal, those resources dominate the revenue picture at present, but they represent resource revenues that can fluctuate rapidly, and do not in any way negate the value of the long-term, relatively stable foundation of the renewable resources, particularly agriculture. Further, only a small percentage of the people in the energy resource counties are actively engaged in energy development. As a consequence, one must not in any way discount or overlook the economic significance of the

TABLE III-4
AVERAGE INCOME DATA

	DOLLARS PER YEAR			VALUE IN 1981 DOLLARS		
	1973	1978	1981	1973	1978	1981
Metropolitan Counties						
Yellowstone,MT	5,578	8,893	10,946	10,291	11,534	10,946
Cass,ND	6,797	9,131	10,586	12,540	11,842	10,586
Average for the 26 largely rural counties						
Nat'l Forest Zone	5,955	6,702	8,944	10,987	8,693	8,944
Nat'l Grassland Zone	6,581	7,098	9,869	12,142	9,205	9,869
Rural Average	6,388	6,976	9,585	11,787	9,047	9,585
State per capita averages						
Montana	5,441	7,528	9,412	10,038	9,763	9,412
North Dakota	6,368	7,683	10,237	11,748	9,964	10,237
South Dakota	5,372	6,992	8,837	9,911	9,068	8,837

TABLE III-5
REVENUES BY RESOURCE CATEGORIES
(values in thousands of dollars)

	GRAZING	TIMBER	MINERALS	OTHER	TOTAL
National Forest Districts:					
FY 1979	319	12	2	44	376
FY 1980	420	14	8	53	495
FY 1981	305	20	5	52	383
FY 1982	307	2	21	76	406
FY 1983	237	2	78	121	438
National Grassland Districts:					
CY 1979	314	1	5,384	403	6,101
CY 1980	820	0	21,587	56	22,464
CY 1981	805	0	41,121	261	42,187
CY 1982	810	0	36,274	317	37,402
CY 1983	1,102	0	32,554	261	33,918
Total Forest:					
1979	633	12	5,386	446	6,478
1980	1,241	15	21,595	109	22,959
1981	1,110	20	41,126	313	42,570
1892	1,118	2	36,295	393	37,808
1983	1,339	2	32,632	382	34,257

renewable resources, even though at present they are vastly overshadowed by the mineral resource revenues in those energy counties.

e. Forest Employment and Budget

The Custer National Forest's FY 1983 budget was $5.2 million, of which $.89 million went directly to salaries, $2.29 million for capital investment, and $2.02 million for operation, maintenance, and project salaries. The Forest employed a total of 207 persons, of which 124 were full-time employees, 6 part-time employees and 77 seasonal employees, including 11 Youth Conservation Corps enrollees.

Federal receipts to the Treasury in Fiscal Year 1983 totaled $34.2 million (see Table III-5). These receipts were derived from grazing fees, timber sales, pipeline and powerline right-of-ways, recreation user fees, special use fees, and mineral leases and royalties payments. Oil and gas receipts made up 95 percent ($32.6 million) of the total receipts. Range fees contributed about 4 percent ($1.3 million), and the remaining one percent was from all other sources.

Twenty-five percent of these receipts were returned to the States and Counties in which the Custer National Forest land occurs. The total payments to the counties was $8.6 million in FY 1983.

f. Forest Issues, Concerns, and Opportunities (ICO's)

The Forest identified ten ICO's to be addressed by Forest planning. Five of these are public issues and the remaining five are management concerns.

1) Planning Issues

ICO 1: At what level of use and management intensity should livestock be managed on the Forest, considering public needs and demands for all resources?

ICO 2: In response to National demands for energy and strategic minerals, how can the Forest

provide for mineral exploration and development while also providing for renewable resources?

ICO 3: How and where will the resource base, including riparian (stream-bank) zones and woody draws, be managed and protected for wildlife in view of competition from other resources?

ICO 4: What are the long-term public and resource management access needs and how should they be resolved?

ICO 5: What is the long-range need for low development areas and classified Wilderness and how should low development areas be managed?

2) Management Concerns

ICO 6: Certain timber volumes from the forested Districts are needed to ensure a reasonable flow to the industry and for the enhancement of range and wildlife habitat.

ICO 7: Recreation opportunity needs to be evaluated across the Forest. Many rural areas depend nearly entirely upon Forest Service facilities and National Forest System lands for public use. Conversely, recreation facilities and public lands near the metropolitan areas are also an integral part of total public recreation opportunities.

ICO 8: The scenic beauty of the lands under the Custer National Forest's management is an important management concern. Existing Visual Condition is used to monitor the upper limits of negative disturbance to the landscape. It is the goal of any management theme to maintain the natural character and beauty of the land as a response to public expectations and administrative policy.

ICO 9: The assessment of the total Public Net Benefit is vital to the selection of the Preferred Alternative. This value includes all returns to society from the Forest, including commodity and noncommodity goods and services, employment and social programs.

ICO 10: The required budgets for each alternative in comparison to realistic expectations of Congressional actions are probably most critical to the success of the Preferred Alternative.

B. Current Resource Situation

1. Recreation

The recreation setting on the Custer is as varied as the land that comprises the Forest. There are mountains, foothills, prairie, and badland environments that are used by the public for many recreation activities.

In terms of the Recreation Opportunity Spectrum (ROS) classes, Table III-6 is a breakdown of 1983 use, expressed in number of Recreation Visitor Days (RVD's).

TABLE III-6
RECREATION USE BY ROS CLASS

Class	RVD's	Percent
Primitive(P)	152,305	19
Semi-Primitive Non-Motorized (SPNM)	37,750	5
Semi-Primitive Motorized (SPM, and Roaded Natural Appearing (RNA's)	531,720	66
Rural (R)	76,350	10
Urban (U)	0	0
Total	798,125	100

These values represent all recreation use, including wilderness and wildlife related. The total capacity is estimated at nearly 3.5 million RVD's, the greatest capacity, of course, falling in the semi-primitive motorized and roaded natural appearing categories. The definition of recreation types can be found in the glossary.

The physiography of the Forest allows access to much of the Forest, with the exception of the Beartooth Mountains and the portions of the Little Missouri Badlands that are as yet unroaded. This situation creates capacity for recreation activities that is greater than what would be expected. The road construction, in conjunction with mineral development in the Little Missouri National Grasslands, has created Semi-Primitive Motorized (SPM) and Roaded Natural Appearing (RNA) opportunities that were not previously available.

The Forest currently has eight private recreation sites including summer home areas, ski areas and camps. There are 45 public developed recreation sites managed by the Custer National Forest which includes 11 trailheads, most leading into the Absaroka-Beartooth Wilderness. These sites provide nearly 430,000 PAOT days (people at one time for 1 day) and the capacity for 524,500 RVD's. There are two visitor information sites on the Forest. The areas open for dispersed recreation total over 2.1 million acres. The Absaroka-Beartooth Wilderness covers 339,841 acres and provides a capacity of about 166,000 RVD's, a capacity that is expected to be reached by 1990.

2. Cultural Resources

The Custer National Forest contains one of the richest and most diverse series of archeological and historical sites in North America. This is due in part to the remarkable diversity in topography and ecosystems found within the widely scattered administrative units of the Forest. As a result of this diversity, the Northern and Northwestern Great Plains and the mountain foothills supported an extremely varied series of Native American groups for at least 14,000 years. Since the advent of non-native settlements, low populations density and limited industrial and agricultural development have contributed to the high

degree of preservation and the generally good condition of the cultural resources.

There are presently 1,820 archeological and historical sites recorded on the Custer, with many more being discovered as energy and mineral development activites occur. These sites range in age and type from Paleo Indian artifacts and camp sites dating to 14,000 years ago to well-preserved wooden lodges affiliated with Mandan-Hidatsa eagle trapping ceremonies of 200 or 300 years ago. Numerous early ranching, mining, and homesteading era sites also are located on National Forest System lands. The cultural resources of the Custer National Forest are more fully defined in the *Prehistoric Overview of the Custer National Forest (1983).*

In recent years, the steadily increasing pace of oil and gas development and minerals exploration has resulted in the discovery and evaluation of hundreds of archeological and historic sites. An increasing emphasis on commodity output in minerals, range, and timber has also placed additional stress on cultural resources and some unavoidable adverse impacts have occurred. The Forest is presently operating the largest and most active cultural resource program in Region 1 and developing more effective ways to protect, enhance, and manage this unique resource base.

Resource enhancement through site development or public interpretation has not been emphasized due to the priority of inventory and mitigation efforts in an energy/minerals development context.

Management activities with the potential for major ground disturbance and possible damage to cultural resources could be reduced under a noncommodity emphasis. The rate of inventory, evaluation, and interpretation of cultural resources would be commensurate with the other noncommodity resource activities. These cultural resource management activities will be accomplished as a planned program, and will not necessarily be responsive to specific activities for other resources. Cultural resource sites will be inventoried and evaluated on their own merits. Management, enhancement, and interpretation would be emphasized.

The highest potential resource impacts occur in energy and minerals development areas. Preservation of sites and avoidance of adverse impacts are emphasized. Program emphasis is primarily on field administration. Some project-specific survey and evaluation would occur to assure compliance with applicable historic preservation laws. Site enhancement and interpretation could occur on a case-by-case basis.

3. Native American Religious Practices Areas

There is at least one area on the Forest that is used by Native Americans for the practice of traditional religious activities and there may be other areas as yet unknown. The one known area is located in North Dakota and the local clan that uses the area has been contacted and a variety of management options considered for the area. Continuing coordination with this group will be needed to avoid loss of the area's value for continuation of the traditional uses.

4. Wilderness, Roadless, and Special Areas

a. Absaroka-Beartooth Wilderness

The Absaroka-Beartooth Wilderness contains 920,377 acres in south central Montana on the Gallatin and Custer National Forests. There are 339,841 acres located within the Custer National Forest in Park, Sweetgrass, Stillwater, and Carbon Counties. One mile of the southwest corner the Custer National Forest portion of the Wilderness borders the northeast corner of Yellowstone National Park.

The Beartooth Mountain Range is composed of Montana's most rugged country and contains the oldest exposed rock formations known to man. The Beartooths are characterized by many peaks over 12,000 feet, deep, sheer-walled canyons, tundra plateaus, many lakes, and steep gradient streams. Granite peak, 12,799 feet, forms the backdrop and is the highest point in Montana. About two-thirds of the area lies above timberline. Active glaciers are found in the headwaters of all streams and on the north side of peaks. Several glaciers contain locusts which were deposited in the snow and ice centuries ago.

Recreation trails from the Wilderness boundary follow every major stream, but only two traverse the full length and continue on to the south. The area offers dramatic climatic relief to the heavily populated Yellowstone Valley around Billings, which is only a two-hour drive from the Wilderness trailheads. This Wilderness receives the third highest use of all Wilderness areas in the National Forest System. On the Custer portion of the Wilderness, two thirds of the use is concentrated along streams and lakes within seven miles of the eight primary Wilderness trailheads and occurs largely on weekends.

The Beartooth portion of the Wilderness contains portions of two man-made reservoirs over natural lakes, and two nonconforming recreation residence cabins in the Sioux Charlie Lake area of the Stillwater River.

The remainder of the Beartooth Ranger District that is adjacent to the Absaroka-Beartooth Wilderness, and a portion of the Greater Yellowstone Area, is managed for a variety of uses. Trails outside the Wilderness are few except for those that provide access to the Wilderness. Some small timber operations occur and grazing of domestic livestock is common in the foothills. Developed campgrounds provide an opportunity for devel-

oped recreation outside of the Wilderness area. These developed facilities receive heavy use during the normal summer recreation season. The area also receives a considerable amount of cross country skiing and a number of trails are developed for this use. Some are completely outside the wilderness and others start outside the wilderness and enter the wilderness for some distance. Big game winter and summer range is common in the lower foothills and on adjacent private lands. These winter ranges are managed to protect their value for wildlife.

Most of the 160,000 recreation visitor days of use on the Custer portion occur during July and August as hiking, camping, and fishing. Winter use from accessible trailheads is increasing rapidly, but is less than five percent of the total use.

Use along the main trails is very heavy, but use off the trails is very light. The terrain is very formidable and discourages cross country use by all except the skilled rock climbers. Several outdoor leadership schools use this area as their classroom. Falls and accidents are common, and necessitate an active search and rescue program. The terrain and weather make aircraft use extremely hazardous. Wildlife populations are small, but diverse. All common mountain wildlife animals may be found in the area.

b. Low Development Areas

The Low Development Area (LDA) concept was initiated on the Custer National Forest through several past (1974 to 1980) land management plans. The Essentially Roadless Areas in North Dakota and the Cook and King Mountain Riding and Hiking Areas on the Ashland Ranger District are examples of existing Low Development Areas. Low Development Areas are areas with special identified management emphasis. Other resource needs and management activities must consider their long-term effect upon the identified emphasis. There are three existing types of LDA's on the Forest: Essentially Roadless Areas, Hiking and Riding Areas, and a special Ponderosa Pine Area. The LDA can, however, apply to wildlife emphasis areas as well. Roadless areas as defined through inventories such as RARE (Roadless Area Review and Evaluation) are defined and discussed in a following section.

In the Badlands (1974) and Rolling Prairie (1975) Unit Plans, 13 Essentially Roadless Areas (ERA's) and one unique Ponderosa Pine Area were established. These areas were delineated, based on their "open space" attributes and values. The Ponderosa Pine area contains the easternmost extension of ponderosa pine. These areas contain many renewable and nonrenewable resources. The long-term direction for these areas was to protect their open space integrity and other special values by limiting the number of roads, signs, and structural improvements. They also emphasize common allotment range management. At the same time, the existing oil and gas leases were to be honored and impacts would be mitigated to the extent possible. After a specific terminal date, "no surface occupancy" (NSO) would be allowed. However, before the NSO date had arrived, rich gas and oil resources were discovered in many of these areas and rapid development took place prior to the NSO date. Currently, some of the areas are highly developed and contain many wells, roads, pipelines, and other oil and gas related facilities, and other areas contain a small number of wells. Wildcat wells (wells outside of a known production area) are not permitted, since the NSO dates have passed. Some areas were not developed before the NSO date and, therefore, are unavailable for development except when involving private minerals or when protection of the Federal estate is required or unless the management strategy is changed through this planning process.

The Cook and King Mountain Riding and Hiking Areas have many surface limitations similar to the ERA's, with a cut-off date of December 31, 1983, for oil and gas leasing, exploration, and development. The intent of maintaining the roadless character is to provide high quality nonmotorized recreation opportunity (Ashland Division Unit Plan, p. 108c).

c. Research Natural Areas

A Research Natural Areas is an area in as near a natural condition as possible which exemplifies typical or unique vegetation and associated biotic, geologic, and aquatic features. The area is set aside in an unaltered condition to provide a representative sample of an ecological community primarily for scientific and educational purposes. General public use is not encouraged.

Presently, there are two existing RNA's on the Forest: Poker Jim on the Ashland District and Two Top-Big Top on the Medora District. There are two proposed RNA's: The Limber Pine Outlier on the Medora District, and the Lost Water Canyon in the Pryor Mountain portion of the Beartooth District.

The Northern Regional Guide identifies 23 ecosystems for the Custer National Forest to add to the Research Natural Area system. Poker Jim contains five, Lost Water Canyon contains six, Limber Pine Outlier contains one, and Two Top-Big Top is undetermined.

A habitat classification system for North and South Dakota is in the development stages. When it is completed representative areas will be evaluated and recommended for classification as Research Natural Areas.

Deer Reservoir and White Rock Spring on the Sioux District are possible RNA's that contain one

TABLE III-7
RESEARCH NATURAL AREAS

HABITAT	TARGETED STATE	AREA
Pinus ponderosa/Agropyron spicatum	MT	Poker Jim-Ashland RD
Pinus ponderosa/Symphoricarpus albus	MT	Poker Jim-Ashland RD
Pinus ponderosa/Prunus virginiana	MT	Poker Jim-Ashland RD
Pseudotsuga menziessii/Festuca Idahoensis	MT	Lost Water Canyon - Beartooth RD
Pseudotsuga menziessi/Physocarpus malvaceus	MT	Lost Water Canyon - Beartooth RD
Pseudotsuga menziesii/Carex geyeri	MT	Lost Water Canyon - Beartooth RD
Abies Lasiocarpa/Clematis pseudoalpine	MT	Lost Water Canyon - Beartooth RD
Abies lasiocarpa/Ribes montigenum	MT	Lost Water Canyon - Beartooth RD
Bur Oak (Quercus macrocarpa)	MT	North Dakota
Pinus flexilis	ND	Limber Pine Outlier - Medora RD
Alpine type	MT	Red Lodge Plateau Upper Hellroaring Creek Beartooth RD
Agrophyron spicatum/Agropyron smithii	MT	Poker Jim-Lost Water Canyon - Ashland Beartooth RD
Festuca idahoensis/Agropyron smithii	MT	Poker Jim-Ashland RD
Beaver Ponds	MT	White Rock Spring
Rivers	ND-SD	(Possibly Sheyenne, Medora or McKenzie RD)
Special faunal populations	ND-SD	Deer Reservoir-Sioux RD (SD)
Temporary ponds	ND-SD	
Temporary ponds	MT	Upper Hellroaring Creek Beartooth RD
Low production potential lakes	MT	Upper Hellroaring Creek Beartooth RD
Lakes with fish	ND-SD	Upper Hellroaring Creek Beartooth RD
Lakes without fish	ND-SD	—
Lakes without fish	MT	Upper Hellroaring Creek Beartooth RD
Lakes with special faunal population	MT	—
Bog meadows	MT	Upper Hellroaring Creek Beartooth RD
Type I stream	MT	Lost Water Canyon Beartooth RD

TABLE III-8
ROADLESS AREAS

Ranger District No.	Roadless Area Name	ACRES BY RESOURCE: Total Net Acres	Tentatively Suitable Timber	Suitable Range	Very High, High and Moderate Mineral Potential: Hardrock Acres	Energy Acres	Wildlife Winter Range
2	Lost Water Canyon	9,800	0	2,769	0	0	2,940
2	Red Lodge Crk-Hellr'rn	14,760	12,362	427	8,921	17,842	8,320
2	Burnt Mountain	9,320	3,176	88	0	9,320	1,920
2	Fishtail-Saddleback	16,560	8,212	675	16,560	16,560	5,225
2	Black Butte	880	20	0	880	880	0
2	West of Woodbine	2,000	559	0	2,000	2,000	244
2	North Absaroka	22,500	4,513	5,537	24,500	22,050	4,900
	North Absaroka (Gallatin National Forest Portion)	159,259	56,021	20,700	89,548	86,648	47,500
2	Line Creek	20,680	4,900	720	12,408	20,680	9,840
	Line Creek (Shoshone National Forest Portion)	112,800	0	Unknown	Unknown	Unknown	Unknown
2	Beartooth	1,180	0	0	1180	0	0
	Beartooth (Gallatin National Forest Portion)	5040	890	900	4720	0	0
2	Rock Creek	200	400	0	200	400	100
4	Cook Mountain	11,700	576	8,892	0	11,700	2,925
4	King Mountain	11,700	586	7,994	0	11,700	8,775
4	Tongue River Breaks*	16,600	470	7,200	0	16,130	6,640
7	Ash Coulee	13,040	0	11,172	0	14,320	4,734
7	Bell Lake	12,460	0	9,860	0	10,860	3,287
7	Bullion Buttes	17,760	0	15,203	0	17,760	1,000
7	Kinley Plateau	11,700	0	16,216	0	19,360	6,454
7	Strom-Hanson	16,760	0	14,661	0	15,320	4,944
7	Twin Buttes	9,000	0	5,285	0	7,370	7,370
7	Wannagan	5,040	0	4,275	0	5,320	0
8	Bennett-Cottonwood	13,760	0	7,104	0	17,040	4,587
8	Lone Butte	7,140	0	2,464	0	8,280	2,499
8	Magpie	6,080	0	3,526	0	6,080	1,986

* Tongue River Breaks is shown and the resources are shown within the area. The area is not considered for Wilderness classification due to the release from Wilderness consideration by the Lee Metcalf Wilderness Law, P.L. 98-140, in 1983.

type of ecosystem each. The Absaroka-Beartooth Wilderness may provide two possible RNA's that would include six of the desired ecosystems.

At this time, there appear to be four areas not identified. This can be reduced to three by using Bur Oak as a North Dakota type instead of a Montana type. Table III-7 shows targeted types by area and the areas containing these types.

d. Little Missouri State Scenic River (State Designation)

The Little Misouri River was classified as a North Dakota State Scenic River, March 18, 1976. This classification prohibits water from this river from being vsed for industrial purposes. Further delineation is made to keep the river in a free-flowing natural state which means that the impoundment, diversion straightening or other modification of the waterway will not be permitted. The primary purpose of this State law is to prohibit inappropriate development and to preserve the historic and scenic integrity of the area (North Dakota SCORP 1980). Additionally, this river is listed on the National Rivers Inventory as maintained by the Heritage Conservation and Preservation Service in the Department of Interior. It is essential that the Forest proceed carefully and limit adverse effects on the river.

e. Roadless Areas

Through the 1979 RARE II process a number of Roadless Areas were identified. Some of these areas are roadless and others have been developed since 1979 by oil and gas developement. Table III-8 lists the areas on the Forest and shows the acres of various resources contained in them. The roadless inventory was updated in 1983 to reflect changes that had occurred due to prior existing commitments.

Following is a brief summary of the wilderness attributes of each of these areas and of the interest expressed by the public. See Appendix C, Roadless Area Evaluation, for further information regarding these areas.

Lost Water Canyon (Montana)

The natural integrity of this area of the Pryor Mountains is essentially intact, although evidence of past sheep grazing can be found in some areas. There are some wheel-track roads in the area, but they are not a significant impact on the area. Wild horses occasionally use the eastern edge of the area. The deeply incised limestone canyons offer an excellent opportunity for solitude and a challenging primitive recreation experience. There are no trails in the area. There are many limestone caves and overhangs that provided shelter for early visitors, and the general area is very rich in archeological sites. The caves and crevices in the limestone also provide habitat for the short-ear bat. The area was recommended for Wilderness classification through the RARE II process and there is still strong public support for Wilderness classification. The Bureau of Land Management has recommended the area adjacent to and immediately to the east of the area for Wilderness classification.

Red Lodge Creek-Hellroaring (Montana)

The area contains about 15 miles of trail and a trailhead plus the evidence of old logging. Some of the natural integrity is lost because of past activities. Traffic noise from several roads can be heard from within the area. Topography is not especially rugged or challenging to traverse. The panoramic view from the area is good. Public interest in Wilderness classification to date has been low.

Burnt Mountain (Montana)

Evidence of man is largely unnoticed in this area except for some evidence of old logging. The opportunity for solitude is limited by the size of the area as some off-site sounds can be heard. The opportunity for primitive recreation is moderate because the area contains some extremely steep and rugged topography. Public support for classification as a wilderness has been low to date.

Fishtail-Saddleback (Montana)

There is quite a bit of evidence of past mining in the are incuding several miles of old roads, trails, and irrigation diches. Nature has healed the impact of many of these scars, but they are still evident. Topographic and vegetative screening provide some opportunity for solitude. Public access to the area is difficult. The opportunity for primtive recreation is much lower here than on many other portions of the Beartooth Ranger District. Minerals interest in the area is high and public support for Wilderness classification has been low to date.

Black Butte (Montana)

There are several range fences, one powerline, and a short piece of road in the area. Most of the area retains its natural integrity. The area is steep but does not offer any unusual challenges. The view from the area is mostly of developments in the valley. Public support for Wilderness classification has been low to date.

West of Woodbine (Montana)

There is little evidence of man and the area is natural appearing. The small size, shape, and topography eliminates the opportunity for solitude. The steep granite talus and outcrops offer an opportunity for technical rock climbing, and bighorn sheep frequent the area in the winter. There has been little public interest in classificatiion of this area for Wilderness to date.

North Absaroka (Montana)

The largest part of this roadless area is on the

Gallatin National Forest. On the Custer National Forest portion the natural appearance and integrity has been slightly impacted by past logging, mining, and trails. These scars have been mostly healed by time and the remaining scars are not obtrusive. Vegetative and topographic screening provide an opportunity for solitude. There has been little public support for classification for Wilderness to date.

Line Creek (Montana)

There is little evidence of man's use in the area, and the area is mostly natural appearing. There is a good opportunity to enjoy solitude in the area and the opportunity for primitive recreation is high. Vegetative and terrain diversity is good. The scenery and view of the high lake area in Wyoming is good. There has been public support for Wilderness classification of the area as it was viewed as an addition to a proposed Wilderness area to the south in Wyoming. The are in Wyoming was not classified as Wilderness. The Absaroka-Beartooth Wilderness is just west of this area and across the Beartooth Highway.

Beartooth (Montana)

There is an existing road and trail in the area plus about 100 acres of private land. This small area offers a moderate opportunity for solitude. The terrain is gentle and offers little challenge to travel. The view from the area is good and the area is similar to surrounding areas. Public interest for Wilderness classification has been low to date.

Rock Creek (Montana)

There is no evidence of man's activity. The area is directly across the canyon from a heavily used paved road and the opportunity for solitude is very low. The area is very steep and a challenge to traverse. From the area one has an excellent view of the Rock Creek Canyon and the switchbacks on the Beartooth Highway. Public support for Wilderness is low even though the area is adjacent to the existing Absaroka-Beartooth Wilderness.

Cook Mountain (Montana)

The natural integrity and appearance of this area are essentially intact except for a few structural range improvements. Vegetative and topographic screening provide an opportunity for solitude. The opportunity for primitive recreation is present and a variety of topography, vegetation, and severe weather conditions enhance this opportunity. There has been little support for classification as Wilderness by the general public and the local population is very opposed to such a classification.

King Mountain (Montana)

The natural integrity and appearance of this area are essentially intact except for a few structural range improvements. Vegetative and topographic screening provide an opportunity for solitude. The opportunity for primitive recreation is present and a variety of topography, vegetation, and severe weather conditions enhance this opportunity. There has been little support for classification as Wilderness by the general public and the local population is very opposed to such a classification.

Tongue River Breaks (Montana)

The natural integrity and appearance of this area are essentially intact except for a few structural range improvements. Vegetative and topographic screening provide an opportunity for solitude. The opportunity for primitive recreation is present and a variety of topography, vegetation, and severe weather conditions enhance this opportunity. Open pit coal mining is proposed on the west side of the area and adjacent to the boundary of the roadless area. When this development takes place, the sight, sound and smell of this will be evident from within the area. This area was recommended for Wilderness classification through the RARE II process. However, since that time, legislation has been passed that released the area to multiple-use management and it does not require study for wilderness classification at this time.

Bell Lake (North Dakota)

The area contains about 1 mile of road and two producing oil wells at this time and drilling could expand. Livestock developments can also be found throughout the area. The opportunity for solitude and primitive recreation exists within the badlands portion of the area. There has been little public support for Wilderness classification to date.

Lone Butte (North Dakota)

The natural integrity and appearance of this area has been reduced by past seismic activity including roads, trails, and some production. There are also a number of structural range improvements within the area. The steep badlands topography offers an opportunity for primitive recreation and solitude. The area contains a number of archeological sites and some habitat for bighorn sheep. There has been only slight interest in classification for Wilderness to date.

Twin Buttes (North Dakota)

The natural integrity of this area is largely intact except for the presence of some structural range improvements. Overall, the roadless area is natural appearing rolling prairie and badlands. The badlands offer an opportunity to experience solitude and primitive recreation. A nationally significant paleontological site is located adjacent to the area and excavation has been underway for the past 12 years. The area was recommended for wilderness classification through the RARE II study but there is local opposition to Wilderness classification.

Bennett-Cottonwood (North Dakota)

Some drilling for oil and gas has intruded into this area and livestock management improvements can be found throughout the area. Much of the area retains its natural integrity and is representative of the rolling prairie. The badlands provide an opportunity for solitude and a challenge to travel. The opportunity for primitive recreation is moderate as there is no water, no hiking trails, and prairie rattlers provide some challenge. There has been no public support for Wilderness classification to date.

Ash Coulee (North Dakota)

Oil and gas development has encroached into some sections of this area and a two-lane, high standard road crosses the area. Overall, most of the area retains a natural appearance except for some structural improvements. The area contains badlands and rolling prairies. The badlands portion of the area offers an opportunity for solitude and primitive recreation. There has been little interest in classification as Wilderness to date.

Magpie (North Dakota)

Oil and gas activities immediately adjacent to the area, plus past exploration and present grazing, has reduced the natural integrity and opportunity for solitude. The steep canyons and badlands have not been impacted, and they provide an opportunity for solitude and primitive recreation. There has been little public support for Wilderness classification to date.

Wannagan (North Dakota)

Wildcat oil and gas development plus two producing wells have encroached into the area and additional development is possible. Overall, the area retains a natural appearance reflecting the undeveloped character of the rolling prairie and badlands. The opportunity for solitude exists in the central portion of the area, but near the borders the adjacent oil and gas activities reduce this opportunity. There is some opportunity for primitive recreation in the area. There is some public support for wilderness classification of this area.

Bullion Buttes (North Dakota)

This area is in a near natural condition. The natural appearence is only slightly affected by old seismic roads still used by ranchers and hunters and some structural range improvements. The opportunity for solitude is high since the only activity in the area generally is the grazing of livestock. The opportunity for primitive recreation is not high because the topography is not especially challenging. The high plateau offers a good panoramic view of the surrounding badlands and rolling prarie. There has been some support for classification as wilderness by the public. The area contains a considerable amount of split estate minerals which restricts management options.

Kinley Plateau (North Dakota)

This area is in a near natural condition. The natural appearence is only slightly affected by old seismic roads still used by ranchers and hunters and some structural range improvements. The opportunity for solitude is high as the only activity in the area generally is the grazing of livestock. The opportunity for primitive recreation is not high as the topography is not especially challenging. The high plateau offers a good panoramic view of the surrounding badlands and rolling prairie. There has been some support for classification as wilderness by the public and the State Fish and Game Department.

Strom-Hanson (North Dakota)

Portions of this area were homesteaded and planted to introduced grasses. There are several old seismic roads that are still used by the local ranchers and hunters. Structural range improvements can be found throughout the area. The rugged badlands topography offers an opportunity for solitude and primitive recreation. In general, the natural appearance of the area has been retained. There is little public support for wilderness classification of this area.

5. Visual Quality

Current management of the visual resource is directed by Unit Plans and the Visual Mangement System, Agriculture Handbook 462. In most cases, the recommended Visual Quality Objectives (VQO's) are adopted. In situations when the VQO cannot be achieved, the mitigation measures are taken to the extent possible to make the impacts acceptable. The goal is to retain natural appearing landscape across the Forest. There are currently a number of areas that are not natural appearing due to oil and gas development, structural range improvements, and other developments. Where possible facilities are screened from public travel corridors and in all cases oil and gas facilities are painted earth tone colors to make them less conspicuous.

6. Wildlife and Fisheries

The Custer provides a wide diversity of wildlife and fish habitats, ranging from alpine meadows, to short and tall grass prairies, to eastern hardwood stands. High mountain streams and lakes support many cold water trout species and in the prairiesthe small water impoundments, lakes and larger rivers support a variety of warm water species. The Forest encompasses four of the five major ecoregions that occur within Forest Service administered lands in Region 1. This wide diversity provides an array of habitats for wildlife species as diverse as prairie chickens and mountain goats, goshawks and eastern chipmunk. There

are also sizeable populations of turkeys, merlins, bighorn sheep, moose, black bears, mule and whitetail deer, and antelope on the Forest. Management for this variety of wildlife and habitats is an ongoing challenge. The Forest also provides at least potential habitats for four threatened or endangered species: grizzly bears, black-footed ferrets, bald eagles, and peregrine falcons.

a. Habitat Diversity

Habitat diversity is a key element in the distribution and abundance of wildlife. The variety, distribution, structure, and successional state of the plant communities affects wildlife populations. Ecosystems are the base units of diversity on the Forest; their abundance, seral stage, and health all affect diversity. Wildlife management species can be used as indicators of diversity.

b. Management Indicator Species

The concept of Management Indicator Species includes both biological indicators (those species which represent a whole group of other species that use the habitat similarly), as well as species of high interest, such as the major hunted species and those listed as threatened or enadangered. The Custer National Forest has established a list of management indicator species and habitat indicators. See Table III-9. The selection of these species was based upon NationalForest Management Act (NFMA) regulation criteria which include the following categories:

1) Threatened and Endangered plant and animal species identified on State and Federal lists for the planning area. See Table III-9.

2) Species with special habitat needs that may be influenced significantly by planned management programs.

3) Species commonly hunted, fished, or trapped. See Table III-10, Major Interest Species.

4) Species whose population changes are believed to indicate effects of management on other species of a major biological community or on water quality. See Table III-11, Habitat Indicator List.

Since there is a wide diversity of ecological communities on the Forest, more than one species was necessary to represent changes. The distribution and abundance of one species was not sufficient to cover the biological communities in all locations. State and Federal biologists and other professionals were consulted in the compilation of this list.

Major interest species are species that are commonly hunted, fished, or have special or unique habitat needs.

c. Threatened and Endangered Species

1) Grizzly Bears

The Custer Forest contains areas that are suitable

TABLE III-9
MANAGEMENT INDICATOR LIST

THREATENED OR ENDANGERED SPECIES
(Federal Listing)

Animals	Plants
Grizzly Bear Black-footed Ferret Bald Eagle Peregrine Falcon Whooping Crane Gray Wolf	There are no federally listed Threatened and Endangered plants likely to occur on the Custer National Forest. Research is ongoing.

SENSITIVE SPECIES
(species listed on official State Lists of Threatened or Endangered species)

Buff-breasted Sandpiper	South Dakota
Interior Least Tern	South Dakota
Mountain Lion	South Dakota
Northern Swift Fox	South Dakota
Osprey	South Dakota
River Otter	South Dakota
Sturgeon Chub	South Dakota
Dakota Skipper (Butterfly)	North Dakota

TABLE III-10
MAJOR INTEREST SPECIES

Elk
Mule Deer
Whitetailed Deer
Big Horn Sheep
Pronghorn Antelope
Sharptail Grouse
Prairie Chicken
Cutthroat Trout

TABLE III-11
HABITAT INDICATOR LIST

Habitat	Indicator Species
Timber:	
old growth	goshawk
dog hair ponderosas pine	whitetail deer
aspen	ruffed grouse
open savanna	king bird (Ashland Ranger District) lark sparrow (Sioux Ranger District)
Riparian:	
tree	northern oriole
shrub	yellow warbler
Hardwood Draw:	
tree	ovenbird
shrub	rufus-sided towhee
Evergreen Shrubs:	
sagebrush	Brewers sparrow
Prairie Grasslands:	sharptail prairie chicken (Sheyenne Ranger District)
Aquatic:	
cold water	(Native strain) cutthroat trout
warm water	largemouth bass

and probably occupied by grizzly bears. The Forest is a part of the Yellowstone Grizzly Bear Ecosystem (YGBE) which includes Yellowstone National Park and portions of the Gallatin, Shoshone, Bridger-Teton and Targhee National Forests. Management in this area is guided by an approved Grizzly Bear Recovery Plan (USDI, 1982) and the "Guidelines for Management Involving Grizzly Bears in the Greater Yellowstone Area" (USDA Forest Service, 1979).

The Grizzly Bear Recovery Plan identifies six grizzly bear ecosystems in the contiguous 48 states. Objective 4 of the recovery plan (page 1) states "Establish recovery of at least three populations in three distinct grizzly bear ecosystems in order to delist the species in the conterminous 48 states." The plan states that the YGBE should be the first priority for recovery efforts due to the large data base and the ongoing research and management in the area.

Presently, the Forest has 110,000 acres of occupied habitat for grizzly bears. A review of sightings and an analysis of habitats neccessary for bears indicated that the Forest does not provide suitable habitat to accomidate bears on a year round basis, however enough suitable habitat is available in the Sillwater drainage to provide seasonal habitats for some bears. While there have been few sightings in recent years, the upper Stillwater is adjacent to areas that have high bear use, and there are no real barriers to prevent a bear from wandering onto the forest.

The Recovery Plan for Grizzly bears indicates an occupied boundary that was drawn based upon the best information available concerning sightings that was available at that time. The analysis that was made as part of the planning effort was based upon habitat evaluation and updated observations and reports. Stratification into Management situations was consistent with the direction provided in the "Guidelines for Management Involving Grizzly bears in the Greater Yellowstone Ecosystem (The Guidelines). The Custer presently has 5,507 acres in Management Situation I, 110,511 acres in Management Situation II and no acres in Management Situation III.

Management Situation I (MSI)

Definition: Situation I is defined as areas that "contain grizzly population centers and components needed for survival and recovery of the species."

Management Direction: Land uses will be made compatible with survival and recovery of the grizzly bear or those uses will be eliminated.

Management Situation II (MS-II)

Definition: Areas that lack distinct grizzly bear population centers and highly suitable habitat does not generally occur, although some habitat components exist and grizzly bears may be present on occassions.

Management Direction: An attempt will be made to make land uses compatible with grizzly bear needs. However, when grizzly bear habitat needs and other land uses are mutually exclusive, the other uses will prevail.

Management Situation III (MS-III)

Definition: Grizzly presence is possible but infrequent. Developments such as campgrounds, resorts or other high human use associated facilities make grizzly bear presence untenable for humans and/or grizzlies.

Management Direction: Grizzly/human conflict minimization is a high priority. Grizzly bear presence and factors contributing to their presence will be actively discouraged. One of the identified limiting factors in the recovery of grizzly bears in the number of preventable grizzly bear mortalities. A preventable mortality is one which could have been reasonably been avoided by management actions and is not a legal hunting mortality. In order to facilitate recover, all forests in the YGBE have a target of zero preventable mortalities. There have been no reports of grizzly bear mortalities of any kind on the Forest.

Estimates of grizzly bear densities are based upon the best information available but are still only estimates. Information from research indicates that the potential for bears in the YGBE is approximately 316 bears (one bear per 28 square miles). Recovery goals state that there should be at least 25 females with cubs of the year, and the reproductive rates should be 2.2 cubs per female.

The present grizzly bear population can only be estimated. In 1959, Craighead and others (1974) estimated the population of grizzly bears in the Yellowstone Ecosystem to be 222 bears. This is a density of one bear to 38 square miles of occupied habitat. Craighead and others (1976) documented a population increase from 1959 to 1967 from 222 to 245 bears, and then a decline from 1967 to 1974 from 245 to 136 bears. The most recent estimate of bears is 197 (Knight et al. 1982) is 197. There is some concern that this estimate is too high.

Using a simple acreage calculation, the Custer National Forest could be able to support 6 bears under a maximum density (one bear per 28 square miles) or 5 bears under a density of one bear per 38 square miles.

Of the total acres of occupied habitat on the Forest (110,511 acres) 94 percent occur within the Absaroka-beartooth Wilderness (103,724 acres). This wilderness was maintained in all alternatives. In addition, under all alternatives the acres of occupied habitat outside of wilderness (6787 acres) were maintained.

TABLE III-12
YELLOWSTONE GRIZZLY BEAR ECOSYSTEM
OCCUPIED HABITAT ACRES

Administrative Unit	MS-I	MS-II	MS-III	Total
National Park Service	2,317,146	—	2,355	2,319,501
Bureau of Land Management	——— Unstratified ———			3,400
Private	——— Unstratified ———			54,845
Forest Service	1,670,606	1,545,163	24,600	3,240,369
Gallatin NF	413,209	354,339	1,100	768,648
Custer NF	5,507	105,004 (1,280 outside Wilderness)	0	110,511
Shoshone NF	412,000	819,600	17,400	1,240,000
Bridger-Teton NF	678,500	50,500	5,100	734,100
Targhee NF	171,390	217,000	1,000	389,390
TOTAL	3,987,752	1,545,163	26,995	5,559,910

2) Black-footed Ferret

At present, there are no known populations of black-footed ferrets (BFF) on the Forest. Since 1910, there have been 29 reports of BFF sightings or sign on the Forest. Two BFF's are known to have been taken from the Forest. One was taken from the Ash Creek drainage in 1936 and the other came from the confluence of Dantz Creek and the Little Missouri River in 1969.

Since most sightings have occurred in or close to prairie dog towns, these areas are considered habitat for the ferret. As part of the endangered species program, the U.S. Forest Service in 1979 designated seven prairie dog towns as essential habitat. These designations were based on the following criteria: actual ferret sighting in a specific dog town and/or ferret sign (plugged burrows and/or ferret tracks) and large dog towns without ferret sign, but adjacent to towns that did have sign). These towns do not meet the minimum requirements set forth by Hillman as necessary to support a population of BFF's over time, ("Prairie Dog Distribution in Areas Inhabited by Black-footed Ferrets").

3) Peregrine Falcon

There is one historical and one probable peregrine eyrie on the Forest. Surveys in recent years, including a helicopter survey in 1984, have not provided confirmed sightings of a Peregrine falcon on the Forest. However, there have been consistent reports of possible sightings in the Pryor Mountains. The 1984 survey did find a peregrine approximately 5 miles from the Forest boundary. As part of the endangered species program, 120,800 acres were designated as essential habitat for the peregrine.

4) Bald Eagle

Populations of bald eagles use portions of the Forest as winter roost areas. There is no known nesting on the Forest in recent years, although one eagle did nest close to the forest boundary in 1982. In 1979, the Forest designated 41,500 acres as essential habitat for the eagle.

5) Whooping Crane

Portions of the Forest, principally the Little Missouri National Grasslands, underlay the migration routes of whooping cranes. The cranes may use these lands occassionally as resting areas during either the fall or spring migration. There have been two reports of whooping cranes on the forest, one in 1975 and one in 1961. Because of the occassional and sporatic use of the Forest by these birds no area has been designated as essential habitat. Protection is afforded to any bird that lands on the Forest.

6) Gray Wolf

As part of the Greater Yellowstone Ecosystem, the forest shares a joint boundary with Yellowstone National Park for a short distance and there are no topographic barriers that would prevent wolf movements onto the forest. Studies have concluded that there is not a viable population of wolves in the Greater Yellowstone Ecosystem and there are no reports of wolves on the forest. However the Yellowstone Ecosystem has been identified as potentially suitable for the recovery of the gray wolf. The elk herds of Yellowstone could provide a prey base for any wolves that might be re-introduced into the Park. None of these herds winter on lands administered by the Forest. Current evaluation idicates that there are no suitable winter habitats for wolves on the forest.

7) Interior Least Tern

There are no known reports of interior least terns on the Forest. Habitat for the bird consists of relatively large sandbars which are isolated from the shoreline. This habitat does not occur often on the Forest, however there may be some suitable habitat along the Little Missouri River.

8) Piping Plover

There are no known reports of piping plovers on the Forest. Habitat for the bird consists of bar, dry, sandy areas along streams and lakes. A minimum of suitable habitat exists on the Forest, generally along, or near the Missouri and Little Missouri Rivers.

d. Big Game

Hunting and fishing are the principal wildlife recreation that occurs on the Forest. In 1982, there were 154,500 recreational visitor days spent in the pursuit of game species. In addition, visitor time was spent observing wildlife and in nature study.

1) Elk

Elk are probably the most desired of all big game animals and interest in this species is high. Over 90 percent of the elk on the Forest are on the Beartooth Ranger District and the Forest provides for a population of about 950 elk. Forage on the winter range is considered to be the limiting factor. Only one winter range is located entirely on the Forest. The rest are at least partially in private ownership. Summer range is not considered limiting since the majority of it is located on high plateaus such as the Absaroka-Beartooth Wilderness where there are very few impacting activities. One elk herd winters on the Forest and summers in Wyoming on the Shoshone National Forest.

There is also a herd of elk in North Dakota on the Little Missouri National Grasslands. This herd currently contains 100 to 150 animals. The Forest and the North Dakota Game and Fish Department are developing an elk management plan that will provide direction and goals for this unique herd. Although the area of suitable habitat for this herd is somewhat limited on the Little Missouri National Grassland, the major use area abutts suitable habitat on the BLM. The upper population limit that is acceptable by local ranchers is probably less than 200 animals.

2) Deer

Mule deer and whitetailed deer provide the largest share of hunting recreation on the Forest. The Forest has sizeable populations of both species. For most of the Forest, the summer and winter ranges for these species are similar. The animals do not migrate to a lower elevation at the onset of winter. Rather, they use the same habitats that they use the rest of the year. For most of the prairie habitats and some of the timber habitats, notably the Long Pines area of the Sioux Ranger District, cover is considered to be the single largest limiting factor in winter. The Beartooth Ranger District is more typical of deer habitats in the Rocky Mountains, where deer winter on lower elevation foothills and summer in high elevation pastures. On this District, forage on winter range is considered to be the limiting factor. Currently, the Forest provides habitat for approximately 27,000 deer, but has the potential to provide for 40,000 deer.

e. Upland Gamebirds — Prairie Grouse

Sharptail grouse are widespread on the Forest, occurring on all Districts except the Beartooth Ranger District. Hunting interest in gamebird species is high, with the greatest interest occuring in North and South Dakota. The Sheyenne District provides 80 percent of the greater prairie chickens found in North Dakota. Habitat requirements for these two species are quite similar. Both sharptail and greater prairie chicken require a 12-inch height of vegetation for successful nesting. Since these species nest early in the spring, only vegetation from the previous year can meet their residual nesting cover requirements. This residual nesting cover was considered the limiting factor on populations of these species.

Currently, the Forest provides 200,000 acres of effective habitat with a potential of 361,000 effective acres for prairie grouse on the Forest. The correlation between acres of effective habitat and number of birds was not defined well enough to make estimations of populations.

f. Fisheries

The Custer National Forest has 3,713 acres of lakes and 333 miles of stream which are considered fishable. Approximately 49,950 fish (6 inches or longer) are produced in the streams on the forest and 378,000 catchable fish are produced in the lakes. These figures include both cold and warm water species. Fishing pressure within the Forest is 48,000 RVD's per year, with a harvest of 171,500 fish annually. This contributes approximately $760,000 to the economy each year. The opportunity for fishing and the sale of licenses are significant contribution Cold water species include cutthroat, rainbow, golden, brown and brook trout as well as grayling. The majority of these species occur on the Beartooth District. The District also contains a few populations of pure strain native cutthroat trout indigenous to the headwaters of some of the high mountain streams. The limited distribution of the pure strain cutthroat requires management consideration to maintain or expand its range. It was selected as the management indicator species for cold water habitats. Cold water fish habitat occurs in a few areas on other Districts, usually in suitable stock ponds.

Warm water species such as largemouth and smallmouth bass occur on all Districts except for the Beartooth District. The Forest is currently in a long-term survey to identify suitable warm water fish habitats and has worked with the various State agencies to stock various ponds with warm water fish. Recently, five ponds have been stocked with bass. The largemouth bass was selected as the indicator species for warm water habitat, under the assumption that if the habitats were suitable for this species, then they would be suitable for all warm water species considered for stocking.

g. Wild Horses

The Pryor Mountains contain a portion of the Pryor Mountain Wild Horse Range. There are about 3,800 acres on the Custer National Forest that are used by these animals. The area is presently managed in cooperation with the Bureau of Land Management (BLM) which has the primary responsibility for management of wild horses. The same horses also range onto the Yellowtail National Recreation Area administered by the National Park Service. The Forest Service and Bureau of Land Management are presently negotiating an exchange of land ownership to improve land ownership patterns and improve management efficiency. When this occurs this 3,800 acres will be administered by the BLM.

7. Range

The Range Management Program on the Custer National Forest is the largest within the National Forest System. Most of the vegetative communities occuring on the Forest have evolved under the influence of grazing, either by domestic livestock or big game.

Rangeland ecosystems on the Custer National Forest are extremely diverse. They vary from high mountain meadows and ridgetops to short, mid, and tall grass prairies. Forage production on suitable range can vary from approximately 100 lbs./acre to over 3,000 lbs./acre. The diversity of the range also makes it very valuable as wildlife habitat. Competition exists between domestic livestock and wildlife species for forage in key areas at certain times of the year.

Wild Horse Territory has been identified on 3,800 acres in the Pryor Mountains east of Lost Water Canyon. This area will be managed in cooperation with the Bureau of Land Management. Because management options are limited, all alternatives considered this area for wild horse management only.

Approximately 78 percent or 1.6 million acres of the Custer National Forest's 2.4 million acres is considered as suitable range. The remaining acres, nearly 835,000 are presently considered unavailable or unsuitable. Lands considered unsuitable or unavailable for grazing include the following types of areas:

a. those that are not presently producing or are incapable of producing greater than 50 pounds of forage/acre;

b. those that are presently producing more than 50 pounds of forage/acre, but are unsuitable for grazing due to unstable or fragile soils; or

c. those that are presently not being grazed in the Absaroka-Beartooth Wilderness, the West Fork of Rock Creek (the municipal watershed for Red Lodge, Montana), and the Lost Water Canyon Proposed Wilderness;

d. and vacant grazing allotments where the past permittees have gone out of business and prospective permittees feel that stocking the allotment is not an economical venture, because suitable areas are restricted by timber encroachment or need major developments.

In 1980, the Custer National Forest permited 875,567 AUM's through direct grazing permits and six grazing agreements. In addition, the Forest and/or the Grazing Associations administer in excess of 100,000 AUM's under private land permits or the equivalent on the National Grasslands.

Past and present range management practices continue to influence the range ecosystems. Existing grazing systems vary from season long use (extensive management) to highly sophisticated deferred and/or rest rotation (intensive management) grazing systems.

Range conditions across the Forest vary from excellent to very poor, with the majority of the suitable acres in the good and fair category. Only a small number of acres are in poor and very poor condition. Tables III-13 and III-14 display range-related information for the Forest.

The majority of the acres in poor and very poor range condition occur mainly on the National Grasslands as portions of these areas are very slow to be reclaimed from the devastation of the dust bowl era. Some of these areas are windblown sand that is easily eroded once the cover of sod is broken or disturbed by man or animal. Other areas are of very low productivity and the vegetative production capacity is low and they are extremely slow to revegetate.

TABLE III-13
RANGE MANAGEMENT PROGRAM INFORMATION

	Ranger Districts*							
	D-1	D-2	D-3	D-4	D-6	D-7	D-8	Forest Total
Number of Allotments	57	26	63	47	81	257	188	719
Number of Permittees	93	31	73	72	134	240	209	852
Current Permitted AUM's	84,518	16,073	52,016	161,226	84,071	248,838	245,977	892,719
Suitable Acres (NFS)	69,447	57,442	124,987	367,994	159,889	466,463	377,717	1,623,939

TABLE III-14
RANGE CONDITION BY DISTRICT

	Ranger Districts*							
	D-1	D-2	D-3	D-4	D-6	D-7	D-8	Forest Total
Acres by Range Condition Class								
Excellent	4,861	2,872	1,079	36,799	15,989	11,662	15,109	88,371
Good	29,863	20,105	111,728	191,357	83,142	219,242	162,418	817,855
Fair	22,223	31,593	11,996	132,478	46,368	228,572	173,750	646,980
Poor	10,417	2,872	184	7,360	14,390	6,987	22,663	64,873
Very Poor	2,083	0	0	0	0	0	3,777	5,860

* Ranger Districts identified by District number
D-1 Sheyenne Ranger District
D-2 Beartooth Ranger District
D-3 Sioux Ranger District
D-4 Ashland Ranger District
D-6 Grand River Ranger District
D-7 Medora Ranger District
D-8 McKenzie Ranger District

8. Timber

The Forest contains 530,195 acres of forested land. Of this, 300,428 acres do not meet productivity standards, and an additional 61,750 acres are not available for timber harvesting due to existing or administratively-proposed special classifications. This leaves 156,731 acres of productive forest land available, tentatively suitable for, and capable of sustained timber management. Productive forest lands are those lands capable of growing at least 20 cubic feet per acre per year. Timber size classes by acreage and percent of total (suitable acres) are shown in Table III-15.

TABLE III-15
TIMBER SIZE CLASSES

Size Class	Acres	Percent
Overstory/Understory	31,503	20.1
Mature Sawtimber	52,662	33.6
Immature Sawtimber	44,668	28.5
Stagnated	8,150	5.2
Pole	15,986	10.2
Seedling/Sapling	3,605	2.3
Nonstocked	156,731	0.1
TOTAL	156,731	100.0

Timber management activities (various types of harvest and cultural practices) and stand replacing fires are the two major factors that can change age class or size class distribution of timber stands. Insect epidemics and disease infestations can also alter timber stands. Without timber management, younger stands will move toward maturity with time, and mature and overmature stands will become decadent with increasing losses from insects, diseases, and fires. With intermediate thinning and removal of mature to overmature stands these losses can be reduced.

Below cost timber sales have occured on the Custer National Forest during the past several years. These below cost sales are a result of high investment needed in roads for the first time access that will be available for future timber harvest as well as for other uses. The need for increased access, scattered geographic units, and relatively high initial road investment costs have contributed to these below cost sales. The number of below cost sales will decrease in the future but there will be some periodically. Until the entire Forest transportation network is in place below cost timber sales can be expected periodically.

The long-term goal of timber management is to have an even distribution of age classes on the Forest. A small timber harvest program such as the Forest has had for the past 5 years (1.5 MMBF per year) is not adequate to reduce losses to natural processes. As a result, the timber stands are becoming overmature faster than they are being harvested.

9. Watershed

Currently, about 1,091,500 acre feet of water annually run off Custer National Forest system lands. Ninety-five percent of that water meets or exceeds state water quality standards. The remainder has excessive sediment due to natural erosion or excessive dissolved salts from certain highly saline soils.

Water quality and quantity can usually be affected by management of the land surface and its vegetative cover. The Badlands in North and South Dakota are an exception because the soil often cannot be vegetated in order to reduce sediment production. Most of the runoff water in the Forest originates in the Absaroka-Beartooth Wilderness where very little human activity occurs which could affect quantity or quality of runoff.

Water use rights and claims are becoming a high priority concern. The Forest has inventoried all its consumptive use developments in Montana, and those used prior to 1973 are filed with the State and are in the process af adjudication. Those in the Powder River drainage are already adjudicated and are now valid uses under Montana State Law. Those uses develped since 1973 have not yet been filed with the State. North and South Dakota do not yet require filing of small consumptive use claims. The Forest now has an inventory of water uses in the Dakotas, and the Forest policy, if fees are not prohibitive, is to file with the States even though they do not require it yet.

In addition to consumptive use claims, the Forest has calculated required instream flows for land in

Montana. These applications have been sent to the Regional Office for presentation to the Montana Compact Commission for consideration according to Montana State Law. The Forest will attempt to claim, through proper procedures, flows that are needed in order to provide water to: 1) Maintain present level of fish habitat; 2) Provide for natural channel maintenance; 3) Continue rafting or floating where already established and where likely to develop; and 4) Maintain the scenic attractions of streams, cascades, and waterfalls.

Most water in the western United States originates on Federal lands, and a large portion of that is from National Forest System lands. When this water flows off the Federal lands it is used extensively for municipal, agricultural, and industrial purposes. Some is used to generate hydropower. It is more useful and more valuable where properly protected to produce *"Favorable Conditions of Water Flow,"* as Congress intended by its passage of the Forest Reserve Legislation. Needs for municipal water, recreation, industry, and power generation will continue to grow, and the supply in some areas will be limited within 20 years.

Only one stream on the Custer National Forest has been dammed for hydropower, West Rosebud Creek on the north side of the Beartooth Mountains. There are also recent applications for hydropower development on East Rosebud Creek and for a new development on West Rosebud below the old Montana Power Company plant which is still operating. Both new plans are for facilities located down near the forest boundary where the streams leave the forest and where recreational concerns are a strong consideration. The liklihood of development and regulation of the installation would be essentially the same under all Alternatives. Each project is rated by its own EIS and a Forest Service Special Use Permit is required in addition to licensing by the Federal Energy Regulatory Commission.

Thirty percent of the land on all except the Sheyenne and Beartooth Districts is badland or similar ecosystems. Most of this land is located where runoff is about 50 acre feet annually/ square mile (less on the Ashland District). If the badland ecosystem produces 50 percent more runoff than the well-vegetated units (1.5 inches versus 1 inch per year), which seems a cons view of surface conditions, then they produce at least 50,000 acre feet annually. Streams draining the badlands carry large amounts of sediment. This naturally occuring sediment is deposited in downstream reservoirs where storage capacities are slowly reduced by this accumulation.

Very little land or vegetation is disturbed per year on the Beartooth District where 89 percent of the Forest's runoff originates. Thus, only a small increase in runoff volumes can be expected from the Beartooth Mountains whereas improved range conditions should reduce runoff from rangeland. Estimates show that total runoff should be slightly reduced (2 or 3 percent) under effects of the Preferred Action but that water quality should be improved because of reduced sediment production from rangelands.

10. Minerals

Changes between the Draft and Final

The entire minerals section has been revised and reorganized to better portray the existing minerals situation on the Forest. Information on the status of leasing has been added as well as the implications of the various land and mineral ownership patterns. This section was revised because many reviewers did not appear to understand the existing situation.

Many different mineral resources are found on lands administered by the Custer National Forest. Among these are oil and gas, coal, uranium, gold, silver, copper, nickel, platinum, palladium, molybdenum, chromite, and iron, as well as the more common variety of minerals, such as sand, gravel, and porcellanite (scoria).

a. Oil and Gas

With the exception of the Absaroka-Beartooth Wilderness and the Pryor Mountains on the Beartooth Ranger District, and the entire Sheyenne Ranger District, nearly all of the lands on the Forest that are available for leasing are currently leased for oil and gas or have leases pending. Furthermore, oil and gas have been produced on the Little Missouri National Grasslands since the mid 1950's. In addition, the Sioux District currently has three producing wells.

Currently, oil and gas production from lands managed by the Forest produces approximately 14 million barrels of oil per year. At this rate of production, the Forest provides the amount of oil used by the Nation in one day or 0.27 percent of the annual National demand. This production involves approximately 302 Federal oil and gas leases containing 703 producing oil and gas wells, in 86 oil fields, most of which are located on the Little Missouri National Grasslands.

1) Leasing and Lease Status

The responsibility for oil and gas leasing of Forest Service lands resides with the Bureau of Land Management (BLM). The Forest Service has the responsibility for reviewing any leasing proposal submitted by the BLM and for making leasing recommedations and/or consent for any land under Forest Service jurisdiction. The role that the respective agencies play in the oil and gas leasing process depends on whether the lands (and minerals) are public domain or acquired. In the National Grasslands there are about 1,152,032 acres of acquired lands and 107,957 acres of pub-

lic domain. On the National Forest Districts there are about 1,166,585 acres of public domain lands and 19,807 acres of acquired lands.

At the start of this planning process in early 1980 the demand for oil and gas was at an all-time high and activity in the Williston Basin was at a peak. At the present time (1986) activity in the Williston Basin is much less. Drilling is continuing but most of it is confined to "in-field" development, or drilling where the probability of success is very high. "Wildcat" wells, those outside of known areas of production is low due to the lower price of oil. Based on national predictions the demand for fossil fuels, and their costs, are expected to continue to increase in the long-term. Periodic highs and lows can be expected but the long-term demand for, and cost of, fossil fuels is upward.

The Mineral Leasing Act of 1920 permits the Secretary of Interior to issue leases and permits sithout the consent of the Secretary of Agriculture for lands, and in this sense minerals, reserved from the public domain. Public domain lands and/or minerals are those which have never been severed from the ownership of the Federal government. Therefore, where oil and gas leasing actions involve public domain lands under the jurisdiction of the Forest Service, the Forest Service responsibility is to make only recommendations. Although the BLM could theoretically lease Forest Service managed public domain lands without Forest Service review, it rarely if ever does so since by interagency agreement the Forest Service reviews lease and permit applications and makes recommendations to protect surface resources and to prevent conflict with other resource activities.

In contrast to the Mineral Leasing Act of 1920, the Mineral Leasing Act for Acquired Lands (Act of August 7, 1947) requires consent by the Secretary of Agriculture prior to leasing of minerals in acquired lands managed by the Forest Service (for the Custer National Forest this is the National Grasslands). In addition, the Forest Service has the right to require terms under which a lease will be issued in order to protect the surface and other resource values on acquired lands.

Oil and gas leases fall into two categories—competitive and noncompetitive. Competitive leases are for lands within Known Geologic Structures (KGS) that are identified by the Bureau of Land Management (BLM). A KGS is a geologic trap in which a productive accumulation of oil or gas has been discovered by drilling. Competitive leases are issued by the BLM for an initial term of five years and will continue in force so long as oil and/or gas is produced. By regulation, Federal oil and gas competitive leases may not exceed 640 acres in size; but typically range in size from 40 acres to the maximum of 640 acres.

Noncompetitive leases are of two types: 1) those that appear on the simultaneous list (O/G SIM) which represent lands that have been previously leased; and 2) over-the-counter leases which represent lands never before leased and which are outside of a KGS. Both types of noncompetitive leases have an initial term of 10 years and will continue in force so long as oil and/or gas is produced. By regulation Federal oil and gas noncompetitive leases may not exceed 10,240 acres in size; there is no typical size for a noncompetitive lease, but the largest are usually no more than 2,500 acres in size.

Therefore, in light of the information given above with regard to lease types and their term length, it can be assumed that any lease with an issue date older than 10-years must be held by production.

An oil and gas lease is a contract between the minerals rights owner (the lessor), here the Federal government, and another (the lessee). It grants the lessee the right to search for and produce oil and gas for a specified period of time-provided the lessee agrees to pay a rental, bonus, and/or royalty, and to comply with other specified stipulations (which are designed to minimize certain environmental effects). Lease terms and conditions are set at the time of lease issuance and, generally, can not be subsequently amended without the consent of both the lessor and the lessee. It is, therefore, the establishment of production that gives a lease an indefinate term and because of established production on 302 leases within the administrative boundaries of the Forest some of the oldest leases date back to the late 1940's and mid-1950's.

As of April 24, 1986, there were 1,547 competitive and noncompetitive leases embracing 1,770,665 acres on the Custer National Forest. This represents approximately 84 percent of the all lands administerd by the Custer National Forest if the Absaroka-Bea rtooth Wilderness is excluded. The Absaroka-Beartooth Wilderness lands were withdrawn from further mineral entry and mineral leasing on January 1, 1984. Oil and gas production is established on 302 leases that embrace 314,461 acres, again, containing approximately 703 producing oil and gas wells. Table III-16 is a summary of the lease situation as is existed on April 24, 1986.

TABLE III-16
CUSTER NATIONAL FOREST FEDERAL OIL AND GAS LEASE STATUS (April 24, 1986)

Ranger District	Number of Leases	Acres Leased	Number of Producing Leases	Producing Acres
Sheyenne	0	0	0	0
Beartooth	77	127,478	0	0
Sioux	96	151,250	4	5,233
Ashland	128	442,075	0	0
Grand River	66	71,174	0	0
Medora	630	503,755	139	128,042
McKenzie	550	474,932	159	181,186
Forest Total	1,547	1,770,665	302	314,461

Leases still in force were issued as far back as early 1949. The oldest leases are found on the McKenzie Ranger District and are held by production. These leases contain only standard stipulations requiring protection of property and restoration of the surface of the land. Typical wording for these provisions is as follows:

> The lessee agrees to take such reasonable steps as may be needed to prevent operations, including operation of operating plants on the leased premises, from unnecessarily: (1) causing or contributing to soil erosion or damaging any forage and timber growth on the leased lands or on Federal or non-Federal lands in the vicinity; (2) polluting air and water; (3) damaging crops, including forage, timber, or improvements of a surface owner; (4) damaging improvements whether owned by the United States or by its permittees or lessees; or (5) destroying, damaging, or removing fossils, historic or prehistoric ruins, or artifacts; and upon any partial or total relinquishment or the cancellation or expiration of this lease, or at any other time prior thereto when required and to the extent deemed necessary by the lessor to fill any sump holes, ditches, and other excavations, remove or cover all debris, and so far as resonably possible, restore the surface of the leased land and access roads to its former condition, including the removal of structures as and if required. The lessor may prescribe the steps to be taken and restoration to be made with repect to the leased lands and improvements thereon, whether or not owned by the United States.

Commencing in 1974, oil and gas leasing of lands administered by the Custer National Forest was done only after the completion of applicable environmental analyses. These analyses, called Unit Plans, identified the types of site specific stipulations to be used, when and where they were to be used, and which lands, in addition, should be made available for leasing.

As for example, these analyses provided for the use of following types of special stipulations:

> *No Surface Occupancy*. This may be applied to steep slopes (generally those over 40 percent); upland breaks ecosystems; river breaks ecosystems; hardwood draws; significant historical, archeological, and paleontological sites; Essentially Roadless Areas (ERA) after the surface occupancy cut-off date for the specific ERA; and wildlife habitat, such as raptor nesting areas and key (high use) big game habitat.
>
> *Surface Occupancy Restriction (by location)*. Used for prairie dog towns; grouse dancing grounds; raptor nests; relict or research natural areas; and peripheral species areas.
>
> *Surface Occupancy Restriction (timing)*. Applied to key big game ranges and use areas; raptor nests; and recreation areas and corridors.
>
> *Activity Coordination Stipulation*. Used for key big game range.
>
> *Limited Surface Use Stipulation*. Applied to hardwood draws and heads of canyons with unique wildlife habitat values.

In many instances, even though the pre-1974 leases contained none of the above special stipulations, many of the operators have agreed to conduct their operations as if special stipulations had been included as part of the lease.

There are 30 leases on the Forest that were issued prior to August 1, 1973 and they include 19,503 acres. There are 32 leases on the Forest that were issued prior to October 1, 1974 that include 22,383 acres. There are 193 leases on the Forest that were issued prior to May 1, 1976 that include 185,170.89 acres. There are presently 302 leases held by production that total 314,461 acres (as of April 24, 1986).

It is estimated that during the next 10-year period, due to lease terminations, approximately 1,400,000 acres will be available for renewed oil and gas leasing. Only those acres within producing oil and gas leases or otherwise withheld from the leasing process, such as for protection of wildlife habitat or low development area management, will not be available.

2) Exploration and Development

An estimated 1,155 oil and gas wells have been drilled on the Forest. Most of these, or approximately 1,100 have been drilled on the Little Missouri National Grasslands of western North Dakota. Again, a little more than 700 of these latter wells are currently producing oil and gas. Another three producing oil and gas wells are located in the North Cave Hills portion of the Sioux Ranger District in South Dakota.

On the Little Missouri National Grasslands oil and gas exploration and development has resulted in the construction of approximately 1,650 miles of roads and 1,250 miles of pipeline designed to carry saltwater to disposal facilities and to transport oil and gas products to refining and marketing facilities. Truck transport of oil and produced water is used where pipelines have yet to be constructed or where pipeline construction is not economical.

The drilling of a Federal oil and gas well is preceeded by the filing of an Application for Permit to Drill (APD). The APD is filed with the Bureau of Land Management (BLM) who is also responsible for approving the Application or rejecting it. The Forest Service can only make recommendations to be included in any drilling permit to be issued.

These recommendations, or special conditions, reflect concerns identified through an on-site examination of the proposed drilling location and a review of resource data and management plans for the area to be affected by the drilling proposal. This drilling proposal analysis, therefore, constitutes a continuation and refinement of the environmental review that began prior to leasing and allows the agencies involved to further mitigate any identified resource conflicts.

With respect to pre-1974 leases, on the Custer National Forest, to be in compliance with lease terms and conditions the operator normally needs only to avoid conflicts with cultural resources and threatened and endangered plant and animal species. However, Onshore Oil and Gas Order No. 1 (43 CFR 3164) has been provided the Bureau of Land Management with broad authorities to regulate activities to the point of requiring the use of special mitigating measures not discussed in the original lease; and with the possibility of denial of surface occupancy in certain management situations, but not to the extent that would totally deny the lessee enjoyment of the lease. But again, most operators will voluntarily accept many of the special conditions that normally would be binding on only post-1974 leases.

The APD is either approved or rejected following the completion of the required NEPA analysis. If the APD is approved the operator receives a drilling permit. By agreement, the Forest Service oversees the pre- and post-drilling construction activities. Basically, pad and road construction and reclamation. The BLM is responsible for monitoring the drilling phase of the operation. In all matters, however, ultimate enforcement authority resides with the BLM.

Due to a complex ownership of land and minerals estates, the Federal government is limited in controlling both the distribution and pace of oil and gas exploration and development within the administrative boundaries of several Ranger Districts. This is particularly true on the Little Missouri National Grasslands where a significant portion of the mineral ownership is frequently held as a reserved or an outstanding right by a party not subject to Federal oil and gas regulations. These complex ownership patterns are due, in a large part, to land purchases made under the Bankhead-Jones Farm Tenant Act. In many cases this has resulted in a checkboard land pattern of surface and mineral ownership that is often further complicated by a mix of split-estate ownership, that is, where the surface and mineral estates are held by different parties.

The Federal government, therefore, has a limited ability to control either access or oil and gas exploration and development in situations where reserved or outstanding mineral ownership occurs, either beneath Federally owned surface or adjacent to Federally owned lands and minerals. Reserved or outstanding (private) mineral ownership is where the minerals are owned by someone other than the federal government and the surface is owned by the Federal government. The Federal government, by law, must grant reasonable access and allow development of private minerals. In most instances, however, negotiations between the Forest Service and the holders of these reserved and outstanding rights mitigate many of the adverse environmental effects normally associated with oil and gas exploration and development.

However, sometimes as a result of this complex land and minerals ownership pattern much oil and gas exploration and development has occurred in areas that otherwise would not have been developed or would have been developed differently if they had been under total Forest Service control. Therefore, where this split-estate ownership occurs the Forest Service is limited in what types of management it can recommend for the surface. To deny the owner of the mineral estate access to his/her minerals is not legal and even though the area can be assigned to a management prescription that states no development will take place, it must be recognized that development can not be precluded where the Federal government does not posses total ownership.

Forest planning documents completed during the 1970's defined roadless areas on two Ranger Districts. In addition, the management decisions for the Essentially Roadless Areas (ERA's) designations on the Little Missouri National Grasslands allowed for surface occupancy until a designated "surface occupancy cut-off date." The latest cut-off date for the Little Missouri National Grasslands was August 31, 1982. After the surface occupancy cut-off date had been attained, continued oil and gas exploration and development could only occur by offset drilling on the adjoining spacing or production units on the same or adjoining lease within the ERA's. Offset drilling is allowed until the limits of the "discovery" pool are defined through dry or nonproducing holes. Spacing units are determined by the state in which they occur. In North Dakota they are commonly 160 acres in size. As a consequence, many of the lands within the ERA's defined by these early Forest planning documents have experienced significant oil and gas development and, most likely, will continue.

When leased Federal mineral estate, under Forest Service jurisdiction, has been identified by the Bureau of Land Management as being subject to drainage from a non-Federal oil and gas well the BLM may require the lessee to drill a protection well or to form a communitization agreement or to make payment of compensatory royalty in order to compensate the Federal government for lost

resources. In the case of unleased Federal mineral estate, under Forest Service jurisdiction, the BLM may request or require that a protective lease be issued subject to Forest Service requirements which may include a "no surface occupancy" stipulation.

Oil and gas exploration and development on the Forest is expected to continue well into the next century. As a consequence of the difference in the terms and conditions of the leases, the complex pattern of surface and mineral ownership on some portions of the Forest, the needs to protect the Federal mineral estate, and decisions made with respect to early planning actions a variety of operational practices may be evident within the administrative boundaries of the Forest. Some of these practices may be inconsistent with the management prescriptions detailed in this plan, however they are legally pro Exploration and development of energy sources such as oil, gas, and coal is expected to continue even though the current (short-term) demand is low. As National needs change over time the demands will change with them, but in the long-run the demands will increase. Hardrock minerals are constantly in demand and the feasibility of development is dependent on pricing. The major ore bodies on the Forest can be expected to be developed when the price situation warrants the large long-term investment needed for development.

There are a number of situations on the Forest at this time that effect how the oil and gas resources, including leasing, can be managed. Basically there are four situations that constrain management activities. These are: 1) existing leases held by production, 2) split estate minerals ownership, 3) offset drilling policy, and 4) leases predating NEPA and Unit Plans.

Existing leases held by production. Leasing of minerals often entails relatively large blocks of lands and often the lands that are included in a lease are scattered over a relatively large area. They are not contained in one contiguous block. If a well is drilled on one of these parcels and is a producer then all the blocks of land originally contained in this lease are held by production and the leases do not expire even though there may be no development on them. This limits what can be done with these lands in that they cannot be assigned to a management scenario that requires no development as the lease holder has the right to develop the lease if he so desires. Also, since the lease does not expire there is no opportunity to issue the lease with new and more restrictive stipulations.

Split estate minerals ownership. Throughout some sections of the Forest there are private minerals under federal surface ownership. Where this exists the Forest Service is limited in what types of management it can recommend for the surface. To deny the owner of the mineral estate access to their minerals is not legal and therefore the area can not be assigned to a management scenario that states that no development will take place. To deny the owner access to his mineral ownership is illegal and to tell the public we will manage the area in an unroaded condition is not reasonable because the Forest Service can not assure the public that it will not be developed.

Offset drilling policy. As a result of past Essentially Roadless Area (ERA) direction which contained No Surface Occupancy stipulations beyond a certain date the Forest developed a policy that allows development to take place adjacent to producing wells. This offset policy allows for the development of a well on the next adcajent spacing unit. Spacing units are determined by the State in which they occur and are commonly 160 acres in North Dakota or 320 acres depending on the characteristics of the oil field. By allowing the development of the adjacent spacing unit the orderly development of areas that were originally ERA's can take place. This policy is still in effect and if the Forest Service recommends against it the Bureau of Land Management may overrule the Forest Service for protection of the Federal mineral estate that someone is accessing by an adjacent well that is on private land or private minerals.

Leases predating NEPA and Unit Plans. There are some very old leases in existence on the Little Missouri National Grasslands. These leases are valid and contain very few stipulations to protect the environment. Some exist within areas that are desireable as low development areas. To not permit development of these leases is not legal as the lease holder has a legal right to develop his lease.

b. Coal

The coal beds within the Fort Union Formation underlie vast areas in North Dakota, South Dakota, and Montana. These States contain some 912 billion tons of coal (Geologic Atlas of the Rocky Mountain Region, 1972). Parts of the Beartooth, Sioux, and Grand River Districts, and all of the Ashland, Medora, and McKenzie Districts are within this area. It is estimated that less than 15 percent of the total is economically strippable. The quality of the coal ranges from lignite up to good quality low sulfur sub-bituminous coal. See Table III-17 for the coal inventory on the Forest.

The northwestern portions of the Beartooth District are underlain by or adjacent to known coal deposits within the Eagle Formation. This amounts to about 50 million tons of high volatile B and C bituminous coal.

There are no known coal deposits on the Sheyenne National Grassland.

The 1977 Surface Mining Control and Reclama-

TABLE III-17
CUSTER NATIONAL FOREST COAL INVENTORY
(Existing Coal in Short Tons)

Ranger District	Shallow Surface Mining (0 to 200')	Underground Mining (100 to 2,000')	Total*
Sheyenne	0	0	0
Beartooth	0	53,000,000	53,000,000
Sioux	144,000,000	70,000,000	181,000,000
Ashland	26,000,000,000	74,000,000,000	85,000,000,000
Grand River	25,380,000	5,000,000	25,380,000
Medora and McKenzie	5,800,000,000	5,000,000,000	7,000,000,000

*Surface and underground mining have overlapping zones. The total tonnage may be less than the sum of its parts.

tion Act specifically prohibits surface coal mining on the National Forest land of the Custer National Forest. This includes the Beartooth, Ashland, and Sioux Ranger Districts. In compliance with the 1977 Law, leasing of coal for surface mining will not be recommended on those lands.

However, some of the coal underlying the National Forest surface is privately owned and could potentially be mined. There are 190,072 acres of privately owned coal across the Forest.

The existence of coal does not presume feasibility of extraction or use at the present time.

c. Locatable Minerals

Exploration for hardrock minerals under the General Mining Law of 1872 has been conducted annually with varying intensities on the Beartooth Ranger District for many years. The majority of this exploration has occurred on the Stillwater Complex portion of the District.

The Stillwater Complex has the largest potential platinum and chrome deposits and the second largest nickel deposit within the United States. These metallic minerals are classified by the U.S. Bureau of Mines (1978) as being "Minerals of Compelling Domestic Significance." The chrome deposits were mined extensively during World Wars I and II when high-grade ore was not available from foreign sources. The Stillwater Mining Co. has recently (1984) submitted a mine plan to develop a platinum-palladium mine within the Stillwater drainage. An EIS is being prepared to assess the impact of this mine.

Uranium (uraniferous lignite coal) was mined on the Sioux Ranger District in the late 1950's. Presently, there is no mining of uranium, but a large number of mining claims are being maintained on the Sioux and Beartooth Ranger Districts.

d. Mineral Materials

Common variety minerals include sand, gravel, and porcellanite (scoria). Sand occurs Forestwide. Gravel is found on all Districts except the Sheyenne Ranger District. Porcellanite occurs on the Sioux, Ashland, Medora, and McKenzie Ranger Districts only. The current use of these materials is almost exclusively for road aggregate.

11. Human and Community Development

Volunteers served 2,506 hours on several Custer Forest projects during FY 1983. In one Senior Community Service Employment Program (SCSEP), enrollees served a total of 908 hours. The Youth Conservation Corps was re-established in FY 1983 and one ten-person crew worked 3,122 hours, or approximately 8 weeks. No Young Adult Conservation Corps was on the Forest during 1983. Neither the YCC nor the YACC programs will be inoperation in 1984 or 1985. The Comprehensive Education and Training Act (CETA) program had 3 participants in 1983 and they worked a total of 912 hours.

12. Land Adjustment, Special Uses, and Agreements

The lands program includes landownership planning, land adjustments, rights-of-way acquisition, special land uses, and land status. These broad functions have many facets.

a. Special Uses

The Forest has about 1,600 Special Use Permits. As a result of the oil and gas activity, there are about 200 new permits granted each year. Special uses are categorized for fee appraisals by kinds of uses, and the number in each category is shown below:

1) Residences and organization sites: 120 permits

2) Agricultural uses: 450 permits

3) Community and Industrial uses for research, training, and Public Information: 55 permits

4) Transportation, Utilities, and Communications: 563 permits

5) Water uses: 407 permits

b. Grants and Agreements

The Forest processes about three U.S. Department of Transportation easements and seven U.S. Department of Agriculture easements per year. There are 11 County Road Cooperative Agreements supplemented by numerous project agreements.

c. Rights-of-Way Acquisition

The Lands program contains a current 5-year road rights-of-way plan and a 5-year range facility rights-of-way plan. These plans call for securing approximately eight road and eleven range facility rights-of-way each fiscal year.

d. Property Boundary Location

Keeping an accurate up-to-date record of the status of lands is an essential process. There are not only a variety of surface ownerships with various incumbrances, but also there are many thousands of acres containing mineral rights reserved and outstanding. The land status is continually changing as a result of special use permits, land exchanges, purchases, title claims, and resurveys. In addition, grants of easements are made to the Department of Transportation, and to States and Counties for road rights-of-way. Grants also are made by BLM of Forest Service land for various easements such as for power and pipelines.

e. Land Ownership Adjustment

The Custer National Forest has a wide variety of land types and ownerships. Because of this, coordination of the Landownership Planning function involves a significant number of complex resource uses Forestwide.

Land adjustment work deals with land exchanges, purchases, and donations. The Lands Program includes making two to three small land exchanges each year of about 160 acres each and occasionally land purchases. These exchanges and purchases are listed in the Forest's land adjustment plans which establishes the priorities of adjustments.

13. Facilities

There are 30 administrative sites on the Forest. Twenty-five of them are on Forest Service land which encompasses 3,706 acres. The remaining five are leased buildings.

There are 47 public and 8 private developed recreation sites on the Custer National Forest which can provide 524,500 possible RVD's. The majority of sites and use ia on the Beartooth Ranger District. The other sites across the Forest offer valuable opportunities for recreation to the small, scattered populations in eastern Montana, western North Dakota, and South Dakota.

Roads are significant facilities which provide access to and within the Forest. The miles of roads within the Forest by jurisdiction are shown in Table III-18.

One of the Forest's issues is the long-term public and resource management access needs. The access to National Forest System lands varies across the Forest. The mineral development in the Little Missouri National Grasslands has created so much access that the resultant traffic has caused detrimental effects to the range and wildlife resources. The Beartooth and Sioux Ranger Districts have limited access to the National Forest System lands because of adjacent private land and inholdings across which a right-of-way must be obtained.

The Forest contains a variety of range related facilities. The present structural range improvements on the Forest are shown in Table III-19.

TABLE III-19
STRUCTURAL RANGE IMPROVEMENTS

FACILITY		NUMBER
Cabin		1
Barn		1
Corral		107
Cattleguards		118
Stock Trail		1 mile
Spring:	Wood Tank	675
	Metal Tank	42
	Concrete Tank	3
	Plastic	84
Wells:	Artesian	82
	Windmill	276
	Pump	208
	Unequipped	12
Trick Tank		14
Pit Tank		512
Dam/Reservoir/Stock Pond		961
Pipeline Water Transmision		438 miles
Ditch Water Transmission		2 miles
Other Water Development		525
Fence:	NF Boundary	551 miles
	Allotment Boundary	1,702 miles
	Internal	864 miles
	Water Source	20 miles
	Right-of-Way	18 miles

TABLE III-18
ROAD STATUS

STATE ROADS		COUNTY ROADS		FOREST SERVICE ROADS	
Montana	39 miles	Montana	76 miles	Montana	930 miles
South Dakota	33 miles	South Dakota	72 miles	South Dakota	469 miles
North Dakota	77 miles	North Dakota	1,355 miles	North Dakota	972 miles
Total	149 miles	Total	1,503 miles	Total	2,371 miles

14. Protection

a. Fire

The Forest contains a wide variety of fuel types because of geographic distance and differences in elevation. Vegetative responses to fire vary widely and many ecosystems are fire related and/or fire dependent. The National Forest System lands have been influenced by man's fire related needs for several hundred years if one cnsiders the use of fire by native Americans. Since shortly after the turn of the century, there has been an attempt by man to restrict or reduce the spread of natural and man-caused fires. This has had some long-term effects on certain ecosystems.

The Forest has stands of ponderosa pine and lodgepole pine that have different relationships to fire. Fire is common in ponderosa pine types. Aggressive fire protection in the moist ponderosa pine type has permitted development of dog-hair stands that eventually stagnate. Periodic low to moderate intensity fires in ponderosa pine thins young stands and retards the encroachment into adjacent grassland areas. In mature stands, fire creates a seedbed for regeneration of a new stand.

Lodgepole pine is generally a fire dependent species. Fire is needed to open the cones and permit seed dispersal, to prepare the seedbed, and to reduce fuel loading. Lodgepole pine matures at a relatively young age and may be killed by light to moderate surface fires. Unlike ponderosa pines' dependence on periodic fires to maintain stand vigor, lodgepole pine is killed and a new stand develops. Lodgepole pine produces dense stands of relatively small trees dying and falling to the ground throughout the period of stand development. The stand ultimately reaches a decadent state that is usually infested with insects and eventually is destroyed by a high intensity fire. Timber harvest and forest fuels management can reduce the fuel loading, provide fire breaks, and remove mature and overmature timber before it is consumed by fire.

The mixed conifer stands on the Forest are composed of a variety of species including Douglas-fir, Engelmann spruce, and subalpine fir. These species all have different responses and associations with fire. Some of these mixed conifer stands grow in environments that have very low fire frequencies.

Fuel loading on grassland types is much lighter than in timbered areas, but grass fires can consume large acreages in a short time. Frequent grass fires alter species composition, and a lack of fire results in a heavier than normal litter accumulation that can cause changes in vegetative composition.

Riparian types are often wet enough that they will not burn except in extremely dry years. Most shrub and tree species associated with riparian areas are thin barked and easily killed by fire, although many such areas often recover quickly, and a new vigorous stand may result from periodic fires.

Prescribed fire is used as a management tool. The Forest prescribes burning for 400-500 acres for fuel treatment annually and 500-1,500 acres for range improvement annually.

Current direction for prescribed fire and unplanned ignitions in the Absaroka-Beartooth Wilderness is addressed in the Interim Wilderness Plan. The Prescribed Fire Management Plan for the Absaroka-Beartooth Wilderness, which further describes the roles for fire, was approved July 6, 1982. The fire management direction of the Interim Plan and the Prescribed Fire Management Plan will be included in the Forest Plan.

Fire has been the principle agent that established the exiting diversity of timber age classes, natural openings, and to a considerable extent, grasslands. Several decades of intensive fire suppression have reduced the amount of this diversity. As an example, the Beartooth District has a good diversity of lodgepole pine stands in ages of 40 years and older, but very few stands less than 40 years of age. Across the Forest, ponderosa pine is encroaching on grassland and natural openings. Prior to intensive protection, the natural fire frequency was probably 5-10 years on grasslands. Open ponderosa pine stands are developing dog hair thickets in the understory that will eventually support-stand destroying fires. Lodgepole pine stands are approaching maturity and will become susceptible to attacks by mountain pine beetle. This situation is characteristically followed by stand destroying/replacing fires within 30 years. See Tables III-20, Fire History for the Period 1970-1979, Table III-21, Fire Occurrence by Month and Table III-22, Fires by Size and Cause.

The Forest has the potential to substantially increase the use of prescribed fire as an effective management tool in such area as fuel treatment, pine encroachment in grassland ecosystems, forage improvement, vegetation management in wilderness, timber management, wildlife habitat improvement, and ecosystem diversity.

TABLE III-20

FIRE HISTORY FOR THE PERIOD 1970-1979

Fire Occurrence by Cause	Number	Percent
Total Lightning Fires	503	85
Total Man-Cause Fires	88	15
Total All	591	100

TABLE III-21
FIRE OCCURRENCE BY MONTH
(1970-1979)

Month	Man- Caused	%	Lightning	%	Total	Total %
January	1	1	1	1	2	1
February	2	2	0	0	2	1
March	2	2	0	0	2	1
April	4	5	1	1	5	1
May	3	3	27	5	30	5
June	3	3	103	21	106	18
July	14	16	138	27	152	26
August	33	39	194	39	227	38
September	17	19	39	8	56	9
October	7	8	0	0	7	1
November	2	2	0	0	2	1
December	0	0	0	0	0	0
	88	100	503	100	591	100

TABLE III-22
FIRES BY SIZE AND CAUSE
(1970-1979)

Size	Man-Caused	%	Lightning	%	Total	Total %
A (less than .25 acre)	38	43	229	46	267	45
B .26 to 9 acres	25	48	221	44	246	42
C 10 to 99 acres	15	17	48	10	63	11
D 100 to 299 acres	5	6	3	1	8	1
E 300 to 999 acres	4	5	1	1	5	1
F 1000 to 4999 acres	0	0	1	1	1	1
G 5000 or more acres	1	1	0	0	1	1
	88	100	503	100	591	100

b. Noxious Weeds

Noxious weed infestations on the Forest and the intermingled private lands are an increasing problem. There are several Federal and State laws that give broad authority for or require control of such weeds.

The Forest has approximately 10,000 acres that are currently infested by noxious weeds. Leafy spurge is by far the predominant species with approximately 7,500 acres. The Forest, in cooperation with County Weed Boards, Grazing Associations, and permittees, is currently treating approximately 3,000 acres per year. Control on the Custer is achieved through the Conservation Practices (CP) program on the National Grasslands.

Present control methods have been predominantly chemical. In spite of the acreage treated each year, the number of acres infested has tended to increase. Current management can be described as a "holding action" at best, designed to decrease the rate of spread until more effective control methods are found.

c. Rangeland Insect Concerns

The grassland ecosystems of the Custer National Forest have historically supported varying populations of grasshoppers and Mormon crickets. These insects, while being an important source of food for some wildlife species, can cause serious problems on range lands if left unchecked.

In 1955, it was determined that Federal responsibility for control of grasshoppers on lands within the various States, including National Forests, was to be provided by Animal and Plant Health Inspection Service (APHIS). In arriving at this decision, the Comptroller General determined that National Forest protection and management funds were not available for the control of grasshoppers. Because the cooperative range improvement activities enumerated in the Granger-Thye Act of 1950 did not include grasshopper control, its use in application of the law for the control of grasshoppers was prohibited. For the above reasons, neither Range Management Funds, Range Betterment Funds (RBF), nor Conservation Practices (CP) are available for grasshopper control.

In recent years, the Forest has undertaken some control programs in cooperation with grazing permittees, landowners, and APHIS in accordance with a Memorandum of Understanding (MOU) dated June 4, 1980. Control has been through ground and aerial spraying of approved chemicals, funded and supervised by APHIS.

The Forest Service is not responsible for actual control of insects in grassland ecosystems, but is

responsible for evaluating any proposed action to determine the impact the action will have on all resource values. The Forest's role is coordination, cooperation, evaluation of range pest management techniques, and providing information.

d. Forest Insect and Disease Conditions

Table III-23 shows the current level of insect and disease acreages across the Forest. Following is a description of those pests, including areas presently affected and present or potential damage attributable to them. For clarity, insect pests will be discussed followed by disease organisms.

TABLE III-23
INSECT AND DISEASE ACREAGES

Insect or Disease	Amount
Mountain pine beetle	10,000 acres
Spruce budworm	17,800 acres
Dwarf mistletoe	28% of all lodgepole pine stands
Root diseases	undefined

1) Mountain Pine Beetle in Ponderosa Pine

The most serious infestation currently existing on the Forest is found on the southern portion of the Long Pines Unit of the Sioux RD. An aerial survey of that area completed in July 1981, showed approximately 5,000 beetle-killed trees scattered over an estimated 10,000 acres of ponderosa pine type.

South of Ekalaka several hundred trees have been killed in widely spaced, small groups throughout susceptible host types.

In both areas, and particularly the former one, infestation intensity has increased significantly during the past few years. Aerial surveys flown in 1980 indicate that groups of dead trees were both much smaller and fewer than in past years. The spread of insect infestations has continued to spread until the present (fall 1984). Though tree per acre mortality is not at this time extreme, we anticipate that such rapid population buildups indicate many thousands more ponderosa pines will be killed in the next few years before beetle numbers begin to subside.

Ponderosa pine mortality attributable to the beetle has reached epidemic proporations in several regions of the western United States in recent years. Though stands in Montana have not had serious infestations lately, yearly mortality is quite high in some areas.

High stand density is directly related to site quality, both of which are positively correlated with damage. Intensive competition between trees in dense stands affects tree resistance to beetle outbreaks. The history of second-growth stands indicates thatoutbreaks usually occur between ages 50 and 100 years, depending upon site quality. Stands often sustain their first serious infestation between 50 and 75 years on site classes III and IV (site index 71-88). On site classes V or VI (site index 43-70) trees are usually 75 to 100 years old when an outbreak first occurs.

Thinning of overstocked second-growth ponderosa pine stands can have a profound effect on beetle-caused mortality. Maintaining stand basal area below 150 square feet per acre has been effective in suppressing beetle outbreaks in the Black Hills. A cooperative Forest Pest Management-Lolo National Forest study has shown beetle-caused mortality was higher where stand basal area exceeded 120 square feet per acre (Griffin, 1975).

2) Mountain Pine Beetle in Lodgepole Pine

A limited number of lodgepole pine stands on the Forest are infested at the present time. A few small groups of beetle-killed trees were observed near Fishtail Butte on the Beartooth RD. Other groups were noticed north of Meyers Creek Guard Station on the District. Though the infestation level is presently low, enough lodgepole pine of a susceptible size and age exist in those areas to warrant special consideration.

The mountain pine beetle presents the most serious threat to the growth of lodgepole pine throughout its range. Populations of the beetle periodically increase and kill most of the large diameter trees before subsiding. The frequency of epidemics appears to be directly related to site quality, with stands on better sites growing into a susceptible condition more rapidly than those on poor sites. Frequency and intensity of outbreaks are related to tree age and diameter, and to the elevation-latitude of the stand (Amman et al., 1977). In general, stands considered high hazard are more than 80 years old with an average diameter (dbh) exceeding 8 inches. Tree mortality is inversely related to increasing elevation-latitude.

3) Spruce Budworm in Douglas-fir

In 1981, moderate to heavy defoliation was observed in several locations on the Forest. In the western portion of the Beartooth RD, approximately 12,800 acres of defoliated Douglas-fir have been detected in the Stillwater River drainage in the vicinity of Meyers Creek Guard Station. Though the affected area is slightly less than that mapped in 1980, a substantial budworm population still exists in that area.

Another nearly 5,000 acres are experiencing moderate to heavy defoliation on the eastern portion of the Beartooth RD in the Pryor Mountains. The area surrounding Wyoming Creek in the Crooked Creek drainage appears to be the most severely affected.

The spruce budworm is the most destructive defoliator in the western United States. The larvae often strip all current year needles and some old needles from trees, resulting in growth reduction.

Buds and developing cones are also fed upon by larvae throughout their developmental period. Continued defoliation results in reduced growth, tree deformity, top kill, and ultimately tree death over extensive areas. Mortality of saplings and pole size trees can occur within 2 to 4 years of repeated heavy defoliation. Larvae can destroy 90 percent of the cone-seed crop on Douglas-fir in 1 year. Budworm damage may predispose Douglas-fir to attack by the Douglas-fir beetle, and true firs to attack by bark beetles or wood borers. In a weakened condition, they may also be more susceptible to winter kill.

Severe defoliation, resulting in tree mortality and abundant dry litter on the forest floor, may result in extremely hot fires. When fire occurs, stands may be converted to less susceptible species (Carolin and Honing, 1972; Swaine et al., 1924).

4) Other Forest Insects

Though not directly related to Forestwide management policy, pine engraver population build-ups can influence project-by-project management decisions. For that reason, the beetle is briefly discussed here.

The pine engraver is occasionally a major factor in mortality of second-growth ponderosa pine, and to a lesser extent, lodgepole pine. In most years, the pine engraver is not important as a tree killer even though large populations commonly infest slash, cull logs, wind-thrown trees, and other forest debris. Infestations in standing trees, during years when the beetle population is low, typically occur in widely scattered individuals and groups of fewer than 10 trees. Often, these trees have been damaged by wind, snow, fire, or lightning.

In especially warm, dry years, this beetle may kill large numbers of apparently healthy saplings and poles, as well as the tops of mature trees. Outbreaks in unthinned young stands may result in the death of groups of 50 to more than 500 trees. In recently thinned stands, without adequate slash disposal, large numbers of remaining trees may also be killed in areas 2 to 5 acres in size. Top killing of older trees is often followed by killing attacks in the lower boles by other species of bark beetles.

Outbreaks seldom follow cutting in actively growing stands. But during warm, dry years, killing of remaining trees is often serious after thinning of stagnated, even-aged stands, and after overstory logging in decadent uneven-aged stands (Sartwell et al., 1971).

5) Diseases

a) Dwarf Mistletoe

Two dwarf mistletoes, *Arceuthobium americanum* on lodgepole pine and *A. cyanocarpum* on limber pine, are present on the Forest. Only the lodgepole pine species is considered important.

A survey made in 1978 showed 28.2 percent of the lodgepole pine stands to be infected. Growth loss was estimated to be 8.8 cubic feet/acre/year in the infected stands, for an annual Forestwide loss of 106 M cubic feet. The major effect of dwarf mistletoe is growth loss, but severe infestations may cause premature tree death.

b) Root Disease

The major effect of root disease is tree killing, either directly or by predisposing trees to windthrow or to bark beetle attack. Mortality may occur as scattered individuals or as centers of dead and dying trees as large as several acres. Timber productivity of areas occupied by large centers is reduced or lost entirely because regeneration ususally dies before reaching merchantable size.

Damage from root diseases has not been measured on the Forest, but we believe it to be substantial in local areas.

c) Other Diseases

Other diseases that may affect management decisions in local areas are stem rusts and stem decays.

Stem rusts reduce wood quality and volume of cankered stems, and may also predispose trees to windthrow.

Stem decays cause defect and cull, especially in old growth stands.

Lodgepole and ponderosa pine are affected by three stem rusts: *Cronartium comandrae, Peridermium stalactiforme*, and *Endocronartium harknessii*. Infection tends to occur in restricted areas, but can be locally heavy and damaging. Site-related factors are unknown.

Stem decay cause by *Fomes pini* is common on Douglas-fir, Engelmann spruce, and ponderosa and lodgepole pine. Site-related factors are unknown.

15. Air Quality

The Custer National Forest is directed by the Clean Air Act Amendments of 1977 to maintain the quality of air passing over its lands. Except where otherwise designated, Class II air quality is to be maintained. There are numerous types of pollution which could be controlled, but particulates, sulfur dioxide, and hydrogen sulfide are the three major pollutants of concern to the Custer.

There are no absolute standards for allowable levels of these pollutants. There is however, an allowable increase above a normal "benchmark level" for each area of concern. For Class II, the allowable mean annual increase for particulates is 19 micrograms/cubic meter and for sulfur dioxide it is 20 micrograms/cubic meter. For Class I the respective values are 5 and 2 micrograms. Allowable levels of hydrogen sulfide are lower because of its extreme toxicity.

The Northern Cheyenne Reservation has received confirmation of its request for Class I status. Portions of that Reservation lie within a few miles of the Custer National Forest and could be influenced by activities on the Custer National Forests' Ashland District. The U.S. Forest Service is not requesting any classification changes at this time.

Air quality is generally good over all lands managed by the Custer National Forest except where oil and gas development is occurring. The Environmental Protection Agency (EPA) recently used a portion of the Ashland District as a study site to determine pollution levels of certain parameters in an unpolluted baseline condition. Most man-caused pollutants are at zero or immeasurably low values on most of the Ranger Districts.

The Little Missouri National Grasslands (Medora and McKenzie Ranger Districts) are experiencing elevated air pollution levels from oil and gas activity. Some smoke is visible from gas flaring in these areas, but greater concern is warranted for the potential of H_2S (hydrogen sulfide) release. This is a poisonous gas which is lethal at very low concentrations. It is present in natural gas from many petroleum-producing formations, and high concentrations occur in some oil fields. Little research is presently available on the effects of H_2S on vegetation and soils but there is a valid concern that they may be serious Present policies on flaring of gas provides an opportunity for serious long-term impacts. There have been few serious problems with human health risk to-date but there have been cases where cattle have been apparently killed by this gas. Oil wells are posted with warning signs, lights, and wind socks to warn the public of this danger. Leakage from pipes is rare. Workers exposed to the dangers of hydrogen sulfice are trained in avoiding the risk and how to deal with an emergency situation.

The majority of the range burning is done on the Sheyenne National Grassland. This area usually has good air flow and pollution as a result of burning has not been a problem to date.

The acreage of slash burning is usually quite small and air movement usually disperses smoke quickly. An increase in slash burning near popular recreation areas that receive heavy fall use could result in some problems.

CHAPTER IV
ENVIRONMENTAL CONSEQUENCES

CHAPTER IV
ENVIRONMENTAL CONSEQUENCES

This chapter forms the scientific and analytic basis for comparison of the alternatives, including the Preferred Alternative, Alternative 10, described in Chapter II. Environmental consequences are the expected effects of scheduled activities necessary to implement an alternative. Each management activity or program is discussed in increasing order of environmental impact. It begins with those activities which have the least effects and ends with those having the greatest effect on the physical and biological components of the environment. This order of disclosure has little to do with an activity's importance. It merely reflects the magnitude of the environmental effects of that activity.

The effects are described as quantitative or qualitative changes from the current situation in terms of significance, magnitude, and duration. Where applicable, the discussion identifies consequences that are direct, indirect, cumulative, or unavoidable. The relationship of short-term use of resources on long-term productivity is also discussed, along with irreversible and irretrievable commitments of resources. Economic and social effects are discussed where applicable.

Mitigation measures were built into the planning process. They were important considerations in the formulation of standards and guidelines, prescriptions, and minimum management requirements associated with each of the alternatives. See Appendix B and Chapter II for more discussion on mitigation measures. Chapter IV discusses mitigation measures which have not been previously mentioned. Mitigation under one activity is the same for all alternatives, although the amount of all activity can change among alternatives.

The format of this chapter attempts to avoid excessive redundancy. The reader is reminded that the sections are organized by PROGRAM or ACTIVITY. For instance, the effects to the soil are discussed throughout the Chapter, as many activities have an effect on the soil. The same is true for visual impacts and air quality. However, the bulk of the effects of the timber harvest program is found in that category. Easy reference can be made to the programs or activity of interest by using the following index:

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Summary of changes between the Draft and Final EIS

Much of this chapter has been revised and expanded to address public comments and revised analysis. More information about the current situation has been provided for nearly all activities. It is believed that in this way the reader can more closely understand the changes, or lack thereof, in the environment created by the activity. Additionally, rewriting has increased the readability and clarity throughout the Chapter. New disclosure has not be substantial, except for that resulting from the new Preferred Alternative, Alternative 10. In many cases, the geographic differences of the Custer National Forest are noted where consequences may differ.

Wilderness and roadless resources surfaced as very important issues, especially in North Dakota, during the public review period for the Draft EIS. Therefore, the discussions have been expanded to be more specific in explaining the analysis. A table has been added to the Roadless Resource Section showing the deposition of each roadless area (from the 1983 Roadless Inventory) in each alternative.

The Threatened and Endangered Species Section has been revised to show the specific species for the Forest and to further explain the grizzly bear situation.

The entire Wildlife Section was revised to more clearly explain the analysis and consequences of the wildlife management program.

The disclosure of environmental consequences from Human and Community Development has been dropped and the section moved to precede developed recreation.

The Buildings and Other Facilities Section has been moved to follow Human and Community Development.

The Fire Suppression Section has been reorganized to better show the Forest situation.

In the Watershed Section, it is further explained that the program varies very little by alternative and that rehabilitation cost are a part of each alternative's budget.

The Slash Control, Site Preparation, Tree Planting and Timber Stand Improvement Sections have all be incorporated into the Timber Section later in the Chapter. Although these four activities create little if any environmental consequences, it seemed more appropriate to group all of the timber activities together.

The Special Use program is better defined and an additional table has been added to the Pipeline Section to give the reader an indication of the projected oil production which is likely to be supported by pipelines.

The disclosure of the hydroelectric dam consequences has been dropped. At the time of the Draft EIS preparation, a proposal had been made for a development on the West Rosebud River (Beartooth Ranger District, Montana). The project has since been analyzed, a permit denied by the Forest Supervisor, and the decision appealed to the Regional Forester. The denial was supported by the Regional Forester on the grounds that "need" had not been established. If this or any other hydroelectric project is proposed, it will require a separate environmental analysis to determine its environmental consequences.

A major reorganization was made to the Timber Section to incorporate the Slash Control, Site Preparation, Tree Planting and Timber Stand Improvement discussions. More discussion has been added regarding the existing situation, recreation, employment, and definitions of silvicultural treatments. Both even-aged and uneven-aged silvicultural systems and associated harvest methods have been determined to be appropriate for use on the Forest, depending upon site-specific physical limitations, the species involved, and other resource considerations. The selection of any silvicultural treatment for a specific will be determined by a certified silviculturist, following an on-the-ground examination of the site and completion of a silvicultural prescription. See the Glossary for definition. The relative amounts of each type of silvicultural system (even or uneven-aged) was analyzed in this EIS to determine the effect of their relationships on other resources.

The Air Resource Section has been dropped as the Forest does not have an air resource program, per se. The information previously contained in this section has been relocated to the appropriate activity or program section, such as Minerals or Fire Suppression. The seriousness of H_2S gas released into the air as a by-product of oil production has been described more fully in the Minerals Section.

Because of the public's interest in the Forest's Mineqal program, the discussion in this section has been revised and expanded. The Bureau of Land Management's participation in the environmental analysis of leases is noted. The Geophysical Exploration Section has been relocated to precede the Leasing Section. An explanation has been added regarding the responsibilities in leasing Federal mineral rights and the differences in leasing between public domain and acquired lands. The reason and need for various leasing stipulations has been described with references to the direction in the Forest Management Plan.

The development of oil resources has been further explained to present its importance to the Nation's energy supply and its effects upon other resources have been clarified.

The Locatable Mineral Section has been revised to clarify the Forest's situation and to explain that locatable mineral production is not projected in future commodity outputs and is not specifically analyzed in this Final EIS. The effects of general mining activities has been retained and clarified to provide a framework for further analysis at the time a proposal is made to develop a locatable mineral source.

The Livestock Grazing Section has been significantly expanded to disclose the environmental consequences of the general range program. This discussion was inadvertently omitted in the Draft EIS. The Structural and Nonstructural Improvement Sections have been revised to more clearly disclose the consequences. The Forest's Noxious Weed Treatment Environmental Impact Statement, completed in May 1986, has been incorporated into this Final EIS by reference in the Nonstructural Improvement Section.

The Road System Section has been expanded to clarify the reasoning for projecting only arterial and collector roads needed for management. Reference is made to Chapter II regarding the strategies for road management after construction. Some reorganization had occurred and an explanation has been added recognizing the importance of roads and access in managing the Forest's resources.

For all tables in Chapter IV displaying resource outputs, first decade outputs are based on planned activities. Other decade values are projected, based on continued implementation of that particular alternative.

A. Wilderness

The amount of classified wilderness remains the same in all alternatives, 339,841 acres of the Absaroka-Beartooth Wilderness in Montana. This Wilderness stretches between the Gallatin and Custer National Forests and comprises the vast majority of the Custer National Forest's portion of the Greater Yellowstone Area. The activities within the Wilderness are not believed to be in conflict with the Greater Yellowstone's management needs.

The acres recommended for wilderness in each alternative are dependent on the objectives for that particular alternative. There are 258,260 acres in the 1983 Roadless Resource Inventory eligible for wilderness classification. It is from this base and few other smaller roadless areas (ineligible for the Inventory) that recommendations are made in each alternative. See Chapter II, Table II-2, Wilderness Designation by Alternative, for identification of each area recommended. Appendix C contains specific descriptions and analysis of each roadless area in the Roadless Resource Inventory.

Potential mining operations could threaten the Absaroka-Beartooth Wilderness which contain about 180 mining claims, located prior to the date of mineral withdrawal (January 1, 1984). If determined to be valid claims by a Forest Service validity investigation, they would constitute preexisting rights and could be developed. See Section U, Minerals, of this chapter for more discussion of mining claims.

There is a significant number of existing oil and gas leases underlying the areas eligible for wilderness classification in North Dakota in the Little Missouri National Grasslands. See Appendix C for identification and discussion for all inventoried roadless areas. Table IV-3 in the Roadless Resource Section displays the deposition of each roadless area by alternative to wilderness, roadless or other management. If wilderness classification were to become a reality through Congressional action, the owners of these leases would in some way have to be reimbursed for their loss of potential revenue.

Activities associated with wilderness classification are trail construction and maintenance, campsite rehabilitation, law enforcement and wilderness user traffic (foot and hoof). Trail construction and maintenance protect soil and water resources while facilitating public access.

It is estimated that the capacity of the Absaroka-Beartooth Wilderness will be reached in 1996, if increases continue at past rates. Additions to this Wilderness will not significantly increase capacity and when capacity is reached, specific analysis will be made to determine the proper course of action. Other recommended wilderness areas in the alternatives, such as Lost Water Canyon, provide additional wilderness experience that is not currently a local demand. Significant public comment supported wilderness classification for Lost Water Canyon and other roadless areas.

Environmental consequences from wilderness classification tend not to impact the natural resources, but rather man's ability to manage those resources for some level of production. Examples would be the inability to build structures in streams to improve fisheries production or the inability to develop an oil and gas lease after a wilderness area was withdrawn from mineral entry. This consequence (oil and gas resource extraction) is of particular concern in the North Dakota portions of the Custer National Forest, where the Williston Basin, a productive oil reserve, underlies the Little Missouri National Grasslands. Designating wilderness areas in

these National Grasslands would remove a significant amount of energy from Nation's available reserves.

Acres assigned to wilderness management for each of the alternatives is shown in Table IV-1.

Alternative 4 recommends the most acreage for wilderness classification, 241,700 acres. This recommendation has the greatest effect upon the production of oil and gas, dropping from a maximum of 345 million barrels in Alternative 3 (no wilderness) to 315 million barrels in Alternative 4. The effect upon the timber resource is to remove 27,787 acres from the tentatively suitable timber base. (See Appendix C for specific roadless area information.) This is not a drastic reduction the potential harvest levels as the characteristics of the potential wilderness lands are generally very rugged and inaccessible. (These acres are initially included in the tentatively suitable because of their ability to grow trees, not on potential harvestibility.) See Chapter II, Table II-21, Major Data Table, under the listing Base Timber Sale Schedule for the harvest levels for all of the alternatives.

Alternatives 3 and 5 offer no recommended wilderness, although both alternatives have significant roadless designations.

Other alternatives explore a variety of roadless and wilderness designations while maintaining the original theme of the alternative. Alternatives with the suffix "a", "b", or "c" indicate an additional roadless and/or wilderness analysis. See Chapter II, Description of Alternatives and Comparison of Alternatives, for further explanation.

Wilderness classification can have an effect upon a local economy. On the Custer National Forest, the anticipated economic effect would be most noticeable in North Dakota where removing large blocks of land from mineral entry would significantly depress the economy.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The establishment of wilderness has some effect on the long-term productivity of the Forest's lands. Although natural productivity and life cycles of the natural resources are maintained and gene pools are protected at maximum levels, opportunities to extract or increase productivity through management are foregone. Primitive recreation opportunities are maximized and protection is given to existing vegetative diversity (or lack thereof) and associated wildlife habitats. Threatened or endangered animal species that may inhabit the wilderness areas, such as the grizzly bear, peregrine falcon, and black-footed ferret, would be afforded protection, but there would be limited opportunity to actively manage the habitats. Other threatened and endangered species possibly found on the Custer National Forest, the interior least tern, piping plover and bald eagle, would most likely not be affected by a wilderness designation due to their association with river bottoms and large bodies of water which do not occur in the potential wilderness areas. There are not any Federally listed threatened or endangered plant species on the Custer National Forest, however, the plants included in state lists and in a Category 2 status of the Federal list would be afforded some degree of protection with a wilderness classification. Natural landscapes and scenery are preserved which may include wildfire or other natural occurring scars.

Irreversible and Irretrievable Commitment of Resources

Establishment of wilderness areas commits those areas to be managed according to the Wilderness Act of 1964 and Forest Service wilderness policy. Wilderness areas are not classified until Congress acts on Forest Service recommendations. Although it is possible for Congress to revoke wilderness classification, it is considered unlikely in the foreseeable future. Therefore, it is assumed that the classification will result in an irretrievable loss of wood fiber. Mineral resources are also affected as historically wilderness areas have been formally withdrawn from mineral entry. The existing leases under such areas would have to be somehow reconciled by Congress, such as compensating leaseholders for lost potential revenues. Because oil and gas leases grant the leaseholder access to the minerals, continuing to honor such contracts could seriously affect the purpose for which the areas were preserved. Locatable minerals could also be irretrievably lost with wilderness classification.

Adverse Effects Which Cannot be Avoided

Wilderness classification prevents the introduction and use of modern conveniences such as vehicles or chainsaws, and facilities such as

TABLE IV-1
ACRES ASSIGNED TO WILDERNESS MANAGEMENT
(M acres)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Recommended	136.7	0.3	0.0	241.9	0.0	182.0	93.5	11.0	11.8	36.6	105.8	9.8	47.6	105.3	18.8	9.8	11.8	0.0	0.0
Established	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8	339.8

campgrounds and toilets. Management of resources within the wildernesses therefore becomes very laborious. Trail construction and maintenance is accomplished entirely with hand labor using native material. Removal of both timber and mineral resources is prohibited or highly restricted, resulting in a loss of fiber and energy resource availability. Control of insects and diseases is generally restricted or extremely costly because of the techniques required. Some infestations, such as Mountain pine beetle and Spruce budworm, survive and reproduce in untreated timbered areas making other treatment efforts less effective. Methods to suppress wildfires must be those which cause little or no ground disturbance, such as hand-built fire line rather than dozer-built. This may result in larger fires and higher suppression costs.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

Classification is not expected to conflict with other management plans for the area surrounding the Forest. Wilderness classification is usually based on the desires of the public (local, regional and National). A conflict could arise if an areas were classified as wilderness and was adjacent to a producing oil field (such is the case with some of the North Dakota roadless areas.) Areas that are presently leased for oil and gas could be in conflict with the intent of wilderness management, as discussed above. See Appendix C for discussion of specific effects on roadless areas and the surrounding area.

Energy Requirements

Of all of the management activities on the Custer National Forest, wilderness makes the least demand on energy reserves. It is possible that wilderness users expend considerable energy in travel to and from wilderness areas, but little additional energy is expended within the area itself. Some energy is required to clear and maintain trails, but this is small compared to total energy use on the Forest.

B. Roadless Resource

The Custer National Forest has a roadless resource base of 258,260 acres, as inventoried in 1983. There are 12 separate areas in Montana and 10 in North Dakota. There are no roadless areas meeting the inventory criteria on Forest lands in South Dakota.

The various alternatives strive to analyze a variety of roadless and wilderness scenarios in conjunction other resource production. The amount of area to be managed as roadless or in low development status is dependent upon the objectives for that particular alternative. There are few, if any, activities specifically associated with roadlessness.

The areas inventoried as roadless resource in North Dakota have remained roadless through the years because the activities required to manage the land, usually range and livestock management, could be accomplished without road construction. Low standard trails and, in some cases, low standard roads access the "roadless" areas and have facilitated the historic level of motorized access. This situation would remain under a roadless, or more appropriate "low development", management scheme. No additional road construction would be allowed unless in conjunction with the development of an oil and gas lease (Access is a lease right.). If a lease is not developed within its term (5 or 10 years), the lease expires and the area would not be leased again in order to protect the surface resource — roadlessness.

The roadless resource inventoried in Montana has remained for a number of reasons: country is too rugged to be feasibly accessed, the cost of road construction exceeds the value of the resource to be extracted or the land has afforded access without the need for a road (gentle topography). Roadless management in these areas, such as Cook Mountain and King Mountain roadless areas (Ashland Ranger District) and the areas lying with the Beartooth Ranger District, requires that motorized access by the general public would not be allowed. Grazing permittees with a pre-existing right to motorized access would retain that right in these areas. Recreation, scenic and wildlife values are protected in either case. The activities associated with the primary uses will be discussed under those activity headings. The acres to be retained in an unroaded or low development condition under each alternative are shown in Table IV-2.

Alternatives 5c and 8 have the most acres assigned to unroaded and low development management, 184,400 and 184,800 acres respectively. The lower acreages of roadless resource in Alternatives 4 and 5a reflect the amount of wilderness recommendation which draws from the same acres, while other alternatives such as 7, 7a, and 7b reflect the roadless acres remaining as a result of commodity-oriented objectives. Appendix C discusses the impacts of each alternative upon each roadless area.

Table IV-3 displays the assignment of the inventoried roadless areas to either Roadless, Wilderness or Other management for each of the alternatives.

Areas assigned to unroaded management may lower the present net value (PNV) of the Forest, by increasing the cost of some management activities that usually required motorized access.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Unroaded and low development management

TABLE IV-2
ACRES ASSIGNED TO ROADLESS MANAGEMENT
(M acres)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Roadless management	M Acres			1983 = 258,280															
	116.8	128.6	120.4	16.6	157.5	45.9	125.9	184.4	125.5	120.1	81.6	93.1	80.3	64.3	184.8	109.0	122.6	0.0	0.0

TABLE IV-3
DEPOSITION OF ROADLESS AREAS BY ALTERNATIVE

Roadless Area Name	Alternative 1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10
Ash Coulee (ND)	R	O	O	W	O	W	O	O	O	O	O	O	O	W	O	O	O
Beartooth (MT)	W	R	R	W	R	W	O	O	R	O	W	R	O	O	R	R	R
Bennett-Cottonwood (ND)	R	O	O	W	O	W	W	O	O/R	O	O	O	O	O	O/R	O	O/R
Bell Lake (ND)	R	O	O	W	O	O	O	O	O	O	O	O	O	W	O	O	O
Black Butte (MT)	W	R	R	W	R	W	R	R	R	R	W	R	R	W	R	R	R
Bullion Butte (ND)	R	O	O	W	R	W	W	R	O	W	O	O	O	O	R	O	O
Burnt Mountain (MT)	W	R	R	W	R	R/W	R	R	R/W	R	W	R	R	W	R	R	R/W
Cook Mountain (MT)	W	R	R	W	R	W	R	R	R	R	R	O	W	R	R	R	R
Fishtail Saddleback (MT)	W	R	R	W	R	R/W	R/W	R	R	R	R	R	R	W	R	R	R
King Mountain (MT)	W	R	R	W	R	W	R	R	R	R	R	O/R	R	W	R	R	R
Kinley Plateau (ND)	R	O	O	W	R	W	W	R	O	O	W	O	O	O	O	O	O
Line Creek Plateau (MT)	W	R	R	W	R	W	W	R	R	R	W	R	R	R	R	R	R
Lone Butte (ND)	R	O	O	W	O	W	W	O	R	O	W	O	O	O	O	O	O
Lost Water Canyon (MT)	W	R	R	W	R	W	W	R	W	W	W	W	W	R	W	W	R/W
Magpie (ND)	O/R	O	O	W	O/W	W	W	O	O	R	O	O	W	O	O/R	O	O
North Absaroka (MT)	W	R	R	W	R	W	R	R	R	R	W	R	O	R	O	R	R
Red Lodge Creek-Hellroaring (MT)	W	R	R	W	R	R/W	R	R	O/R	O/R	W	R	W	R	R	R	R
Rock Creek (MT)	W	R	R	W	R	R	R	R	R	R	W	R	W	R	R	R	R
Strom Hanson (ND)	R	O	O	W	O	O	R	R	O	O	O	O	O	W	O	O	O
Twin Buttes (ND)	W	R	O	W	R	R	R	W	O	W	O	O	O	O	W	O	R
Wannagan (ND)	R	O	O	W	O	W	O	O	O	O	O	O	W	O	R	O	O
West of Woodbine (MT)	W	R	R	O	O	W	R	W	R	R	R	R	R	W	R	R	R

W denotes Wilderness, R denotes Roadless, O denotes Other which may or may not require roading. R/W, O/R, or other combinations note that the area was split between two designations.

enhances long-term preservation of the roadless resource that may be threatened by development. The natural land productivity is maintained, but the opportunity to increase other resource productivity or extraction of such resources through active management is foregone. Unroaded management offers the opportunity for semi-primitive recreation and is important in the maintenance of existing vegetative types and associated wildlife habitats. Natural landscapes are preserved.

Irreversible and Irretrievable Commitment of Resources

The assignment of acreage to unroaded or low development management is not irreversible. Any proposed change of the unroaded designation must be intensively analyzed, including public involvement, and would constitute a revision or amendment to the Forest Plan. If oil and gas leases are developed in designated roadless areas prior to the lease expiration date, the roadless resource would be lost until production ceased and all roads and intrusions were removed. Unroaded designation results in an irretrievable loss of renewable resources that are produced but not harvested, such as timber. However, livestock forage will continue to be produced in roadless areas and harvested by grazing. Similarly, wildlife will continue to reproduce and be harvested through hunting in these roadless areas.

Adverse Effects Which Cannot be Avoided

Unroaded designation means that timber harvest is not scheduled using ground-supported systems. A loss of wood fiber would occur. This designation also limits the methods of mineral exploration to non-conventional, i.e. vibroseis or portable. If development of the oil and gas resource would occur, as discussed above, the roadless resource would be adversely affected. Likewise, the designation of roadless areas with the requirement to not lease the mineral rights would substantially limit, if not eliminate, the development of the mineral resource. This resource would not lost, but would remain in it original underground storage. It is the opportunity to extract the resource that would be adversely affected. Many types of wildlife and fish habitat improvements may be impossible or expensive to accomplish. Control of insects, disease, wildfire, and noxious weeds will require special, mostly manual techniques without vehicular support, and sometimes more expensive techniques.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

An obvious conflict associated with roadless or low development management involves the development of mineral resource, primarily oil and gas. When leases are issued, the United States government enters into a contract (usually ten years) assuring the leaseholder of access and developmental rights unless the leases contains stipulations stating otherwise, such as a No Surface Occupancy stipulation. Mineral rights under most of the roadless areas have been leased and to impose an administrative classification, such as roadless or low development management, by way of this Forest Plan, creates a possible conflict.

Conflicts with other agency land management plans are not known to exist. In fact, the Custer Forest Plan is specifically in synchronization with the Bureau of Land Management intent for managing the Pryor Mountain Wild Horse Range.

Energy Requirements

Roadless or low development management involves few demands for energy. Some energy may be used to maintain recreation facilities (primarily trails and trailheads), but this use is associated with recreation.

C. Human and Community Development

The Forest has a volunteer program that includes campground hosting, campground maintenance and trail construction and maintenance. Other resource projects using the volunteer program, include clearing road access to fuelwood areas, watershed improvement, and wildlife habitat improvement, such as cutting aspen stands to stimulate regeneration. See Chapter III for actual hours of volunteer time used in the past year.

The number of volunteers varies from year to year depending on the availability of qualified individuals and proposed projects. The program contributes little to the economic base, but has an important social contribution. Individual volunteers gain the satisfaction in contributing to the environmental well-being of the Forest.

Other programs the Forest include work study, stay-in-school, Youth Conservation Corps, CETA, and senior citizen programs. The Forest involvement with these programs is low, due primarily to limited budgets. Participation in these programs is not analyzed in the alternatives nor are any environmental consequences assessed. These activities, like personnel management, are considered to be support activities to land and resource management.

D. Buildings and Other Facilities

There are a number of buildings owned, leased, or maintained by the Forest. These include houses, barns, offices, visitor information centers, work stations, garages and storage facilities, and are located throughout the Forest in Montana, North Dakota and South Dakota. These structures occupy 3,706 acres, an insignificant portion of the total Forest acreage. Construction caused some soil disturbance on the sites, and in some cases water relationships for a specific sites have been changed because of the landscaping and maintenance. In some locations, the presence of buildings has altered the landscape. In all alternatives, new construction, reconstruction, or removal of buildings will be handled on a case by case basis. Maintenance will continue on all present facilities. Administrative facilities are necessary to continue the Forest's management. The equipment and supplies stored in warehouses, livestock, vehicles and offices all support the Forest's programs. The amount of required facilities is not analyzed in the alternatives, but their environmental consequences are disclosed here.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Soil and vegetative productivity will not exist at the exact location of the facility during its lifetime.

Irreversible and Irretrievable Commitment of Resources

Since no plans have been made to destroy or remove buildings or facilities, the commitment to this use is irreversible. The vegetation lost represents an irretrievable commitment. Administrative sites are withdrawn from mineral entry which constitutes a holding in abeyance the underlying minerals, if any. This commitment remains until such withdrawals, upon review, are revoked .

Adverse Effects Which Cannot be Avoided

Facilities affect the natural landscape, but through site location, design and landscaping the changes are acceptable. Reducing or eliminating soil productivity through soil disturbance will remain long after the facility is gone.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

None identified.

Energy Requirements

The energy required to heat and light the various buildings averages about 5,014,156,000 BTU's each year, and does not change among alternatives.

E. Developed Recreation

Developed recreation includes those recreation activities that occur in some type of permanent

facilities and some level of service is provided. The Forest currently has 45 developed sites, including 11 trailheads. These sites provide nearly 430,000 PAOT-days (people at one time for one day) and the capacity for 524,500 recreation visitor days (12 hours of use). There are two visitor information sites and eight private recreation sites that include summer homes, a ski area and organization camps. Activities included in this category are camping, picnicking, downhill skiing and observation. There is not a significant developed recreation resource offered by private industry or other other government agencies in the vicinity of the Forest. The Forest Service campgrounds, particularly in the more rural areas in North and South Dakota, are the primary recreation sites for local residents.

Most of the facilities on the Custer National Forest are classified as destination, as opposed to "pass-through" traffic and receive heavy use during most of the summer. The developed sites along the Beartooth Highway, south of Red Lodge, Montana, attract and serve may tourists traveling to and from Yallowstone National Park. These site contribute to the recreation opportunities of the Greater Yellowstone Area. Other sites across the Forest often receive the peak load during hunting season because public lands available for hunting and fishing can be quite scarce.

Developed recreation sites offer the public specific areas to recreate and observe the management of the Forest's lands. Likewise, the public observation of the management activities from these use area and travel corridor becomes very important in analyzing the potential visual impacts from Forest activities.

Administrative costs of developed recreation sites are high per acre due to construction, maintenance, cleanup, monitoring, and policing. Some income is generated through user fees (commensurate with the level of development and service). This income is far from off-setting the cost of administration and has little effect on the PNV of any of the alternatives.

Projected use at developed recreation sites for each alternative is displayed in Table IV-4. Decade 1 shows the expected use trend. The values for Decades 3, 5, and 7 are projected with less certainty.

Developed recreation use does not vary a great deal by alternative because the developed sites would remain open in most of the alternatives. Use in Alternative 5a is projected to be the highest because of additional site construction, longer seasons of use and greater recreation emphasis Forestwide. Alternative 8 requires a significant amount of land to be managed at a minimum intensity, thus closing some sites and shortening the use season by three to four weeks and producing the least amount of recreation vabitor days. All alternatives provide for anticipated recreation demands for the plan period of 10-15 years.

The economic effect of developed recreation can be important to local communities and businesses that serve the recreating public. Restaurants, taverns, shops and motels receive a significant economic boost during high recreation season, usually the summer months. The Red Lodge Mountain Ski Area brings in winter sports oriented recreationists in the winter months. An estimated 1,500 skiers a day frequent the ski hill.

For businesses dependent upon resource extraction, such as ranching or lumber mills, the fact that the developed recreation sites occupy such a small acreage (582 acres) creates little to no effect on the their economics.

Developed recreation facilities are very important to many Forest users and are popular avenues to enjoy the National Forest. Closing sites or reducing service levels often results in an outcry by the public.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The long-term productivity of a very small portion of the Forest (582 acres) is adversely affected by the construction and maintenance of developed sites. Because most of the sites have been in place for nearly twenty years, some native vegetation has been replaced by graveled or paved roads, camp sites, picnic grounds and toilets. These facilities prevent greater resource damage, such as soil erosion and water sedimentation and pollution. Some portions of the Red Lodge Ski Area have been converted to grass from timber cover by ski slopes development. The vegetation on other sites has been suppressed by the concentrated trampling of the users. These effects

TABLE IV-4
PROJECTED DEVELOPED RECREATION USE BY ALTERNATIVE
(M RVD's)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Developed Recreation																			
Decade 1	400	442	450	427	462	466	455	461	448	445	388	439	412	417	368	449	433	450	361
Decade 3	611	671	680	649	690	711	678	694	677	677	581	667	626	930	521	677	638	676	507
Decade 5	662	730	745	705	750	766	758	757	734	740	634	732	687	687	559	734	686	723	538
Decade 7	681	754	770	726	776	788	781	782	755	762	653	757	710	709	570	755	702	732	547

remain evident for a long period of time even if the sites were abandoned. Efforts to restore the sites to previous productivity would be costly and of questionable success.

Irreversible and Irretrievable Commitment of Resources

Once established, recreation sites are likely to be maintained and become an irreversible, long-time commitment of a resource. Some wood fiber and forage produced on the sites is irretrievably lost, while at some sites, small timber sales can be made within a developed site to regenerate the stand and some livestock grazing can occur prior to or after the recreation season.

Adverse Effects Which Cannot be Avoided

Much of the vegetation on these sites has been lost or suppressed. Dust and noise from the concentration of campers exist. There is also an opportunity for vandalism to developed site facilities. Wildlife habitat in the developed site area will be lost for part or all of the year.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

There are no known conflicts with other recreation opportunities in the vicinity. The National Forest recreation sites fill an obvious void in the semi-primitive experience. Other recreation developments owned by private industry or other government agencies offer a different, not necessarily a competitive, recreation experience for the public.

Energy Requirements

Energy will be used in the administration of these sites and their users. Most campgrounds require garbage removal on a regular basis, fee collection, law enforcement and annual maintenance, requiring energy in administrative vehicles. Energy use by alternative and decade is shown Table IV-5.

F. Dispersed Recreation

Dispersed recreation occurs on land and after which is not developed for intensive or concentrated recreation. Dispersed recreation opportunities fall into two categories: that associated with roads and that associated with lack of roads. The amount of resource management activities across the Forest, i.e. timber harvest, road building or oil production, affects the proportion of dispersed recreation dependent upon roads or roadlessness. It is possible that the ROS (Recreation Opportunity Spectrum) category of dispersed recreation use can change among alternatives according to the way other resources are managed. (See Table II-21, Major Data Table for ROS projections.) "Rural", "Roaded natural" and "Semi-primitive motorized" recreation occur in conjunction with roads that may be a result of resource management. "Primitive" and "semi-primitive non-motorized" recreation requires a roadless setting. Use can be motorized or non-motorized, including activities such as fishing, snowmobiling, driving for pleasure, camping and picnicking.

The Custer National Forest has an abundance of semi-primitive motorized and roaded natural recreation opportunity, over 3 million RVD's are available. Of course, use is nowhere nearly this level. (1980 reported use in this category was about 219,500 RVD's.) Primitive and semi-primitive non-motorized capacity is estimated at 191,000 RVD's and use in 1980 was approximately 95,000 RVD's. Dispersed recreation use is not expected to exceed supply in the foreseeable future. Roaded and unroaded areas can provide opportunities for people to have semi-primitive recreation experiences with or without the convenience of mechanized equipment. Wilderness use, also a dispersed recreation activity, precludes the use of mechanized equipment and provides a solitary recreation experience. See Chapter II, Table II-2, Wilderness Designation by Alternative.

Management activities associated with dispersed recreation include maintenance and construction of facilities such as trails, trailheads, toilets, hitchracks, stock ramps, parking areas, and administrative action such as compliance checks and information signs to enhance the recreation experience of the Forest visitor.

The effects of these activities and uses on soils, water, and vegetation are similar to those discussed for developed recreation sites (see above), but are usually less in intensity and more widespread. Maintenance costs per acre are not as high. Although the extent of dispersed recrea-

TABLE IV-5
DEVELOPED RECREATION ENERGY CONSUMPTION

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Developed Recreation (Millions of gallons of gasoline)																			
Decade 1	1.61	1.77	1.81	1.71	1.85	1.87	1.83	1.85	1.80	1.79	1.56	1.76	1.65	1.67	1.48	1.80	1.74	1.81	1.45
Decade 3	2.45	2.69	2.73	2.61	2.77	2.85	2.72	2.72	2.72	2.68	2.33	2.68	2.51	2.53	2.09	2.72	2.56	2.71	2.04
Decade 5	2.66	2.93	2.99	2.83	3.01	3.07	3.04	2.95	2.97	2.94	2.54	2.94	2.76	2.76	2.24	2.95	2.75	2.90	2.16
Decade 7	2.73	3.03	3.09	2.91	3.11	3.16	3.14	3.14	3.06	2.62	2.62	3.03	2.85	2.85	2.29	3.03	2.82	2.94	2.20

tion activity and emphasis depends upon the objective of the alternative, these impacts actually occupy only a small acreage of the Forest under any alternative.

Table IV-6 displays the projected dispersed use for all alternatives. The certainly of the projections lessens after the first decade, or the Plan period.

The availability of dispersed recreation opportunities can have an effect on the local economy. Local businesses which cater to recreationists will benefit most by those alternatives which emphasize recreation. The amount of wilderness recommended in an alternative has a two-fold effect: offering more primitive recreation but less semi-primitive motorized or roaded recreation opportunities. Alternatives 3 and 5 do not add any additional acres to wilderness. Alternative 4 adds 241,900 acres to wilderness. Similarly, designating additional acres to roadless management will reduce the opportunity for dispersed motorized recreation unless the area is designated to low development management where existing low standard roads or trails would be retained.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The short-term use (construction and maintenance) of trailhead facilities, toilets, hitch-racks, stock ramps, and loading areas will have similar long-term effects on productivity as developed recreation sites (see above). Although trails can be abandoned and may eventually return to near original condition, this is not likely to happen as long as the demand for dispersed recreation remains.

Irreversible and Irretrievable Commitment of Resources

Once facilities and trails are constructed, they are likely to be maintained into the foreseeable future. The small amount of vegetation displaced by these facilities constitutes an irretrievable loss.

Adverse Effects which Cannot be Avoided

The effects of these activities can potentially include soil erosion on trails, water pollution (human waste and garbage), vegetation damage, and vandalism. Adequate trail construction tends to mitigate most soil erosion and sedimentation, but some will still likely occur. The loss of vegetation displaced by the construction and maintenance of the facilities and trails cannot be avoided. These facilities and trails will tend to concentrate use in certain areas and along certain routes. Human waste, trash and vandalism is managed by efficient and effective field administration of dispersed recreation use, public information and education. These efforts do not eliminate all adverse effects.

TABLE IV-6
PROJECTED DISPERSED RECREATION USE BY ALTERNATIVE
(M RVD's)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Dispersed Recreation (includes the following 5 categories)																			
Decade 1	530	555	566	456	575	580	570	573	564	560	508	551	527	530	481	565	551	560	485
Decade 3	915	851	902	874	891	907	896	895	885	887	790	841	805	806	706	885	872	876	712
Decade 5	1092	983	1057	1021	1033	1042	1035	1039	1026	1020	923	975	936	834	920	1026	1015	1013	826
Decade 7	1215	1067	1157	1116	1125	1128	1122	1130	1115	1108	1008	1058	1018	1016	894	1115	1110	1093	904
Primitive recreation																			
Decade 1	148	155	158	153	161	162	160	161	158	157	142	154	147	148	135	158	154	157	136
Decade 3	256	238	253	245	250	254	251	251	248	246	221	235	225	226	198	248	244	245	199
Decade 5	306	275	296	286	289	292	290	291	287	286	258	273	262	262	230	287	284	284	231
Decade 7	340	299	324	313	315	316	314	317	312	310	282	296	285	284	250	312	311	306	253
Semiprimitive nonmotorized recreation																			
Decade 1	32	33	34	33	34	35	34	34	34	34	31	33	32	32	29	34	33	34	29
Decade 3	55	51	54	52	53	54	54	54	53	53	47	50	48	48	42	53	52	53	43
Decade 5	66	59	63	61	62	63	62	62	62	61	55	59	56	56	49	62	61	61	50
Decade 7	73	64	69	67	68	68	67	68	67	66	60	63	61	61	54	67	67	66	54
Semiprimitive motorized recreation																			
Decade 1	101	105	108	104	109	144	108	109	107	106	97	105	100	101	91	107	105	106	92
Decade 3	174	162	171	166	169	172	170	170	168	167	150	160	153	153	134	168	166	166	135
Decade 5	208	187	201	194	196	198	197	197	195	194	175	185	178	178	156	195	193	193	157
Decade 7	231	203	220	212	214	214	213	215	212	210	191	201	193	193	170	212	211	208	172
Roaded natural recreation	M RVD			1983 = 176 (First year in ROS)															
Decade 1	175	183	187	180	190	191	188	189	186	185	168	182	174	175	159	186	182	185	160
Decade 3	302	281	298	288	294	299	296	295	292	290	261	277	266	266	233	292	288	289	235
Decade 5	361	325	349	337	341	344	342	343	339	337	305	322	309	308	271	339	335	334	273
Decade 7	401	352	382	368	371	372	370	373	368	366	333	349	336	335	295	368	366	361	298
Rural recreation	M RVD	1983 = 76 (First year in ROS)																	
Decade 1	74	78	79	76	80	81	80	80	79	78	71	77	74	74	67	79	77	78	68
Decade 3	128	119	126	122	125	127	125	125	124	123	111	118	113	113	99	124	122	123	100
Decade 5	153	138	148	143	145	146	145	145	144	143	129	137	131	131	115	144	142	142	116
Decade 7	170	149	162	156	158	158	157	158	156	155	141	148	143	142	125	156	155	153	127

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

The dispersed recreation activities may conflict with other resource uses such as timber harvest, mineral exploration and development, and livestock grazing. In some areas of the Forest, confrontations have been known to occur between dispersed users and grazing permittees. Often times, land permitted to livestock grazing is illegally posted as privately-owned, rather than available for public use. However, dispersed recreation is a much desired use not only by the local population who benefits economically by the use, but also by tourists who visit these areas.

Energy Requirements

Energy is required for field administration and the maintenance of dispersed recreation facilities. Some energy is required to clear and maintain trails, but this is small compared to total energy use on the Forest. There may be an increased energy requirement to maintain roads for dispersed recreation when they are no longer needed for resource management. The major use of energy associated with dispersed recreation (roaded, semi-primitive, and wilderness) is that used by the public in travel to and recreating in the Forest.

Anticipated energy consumption for dispersed recreation is shown in Table IV-7.

G. Cultural Resources (Historic and Prehistoric)

As discussed in Chapter III, the Custer National Forest is extremely rich in cultural resources. *The Prehistory of the Custer National Forest — An Overview*, available at the Supervisor's Office, Billings, Montana, further describes the richness and diverse series of prehistoric archeological sites on the Custer National Forest. Therefore, mitigation of impacts from Forest activities is necessary. Cultural resource protection, interpretation, and salvaging are expensive and time-consuming. The major purpose of the Forest's cultural resource management program is to catalog or preserve cultural resources and comply with the various Federal laws, regulations, and policies. In all alternatives, an inventory of sites will be required where ground-disturbing activities are planned. If a historic or prehistoric site is found before or during ground disturbing activity, it will be documented and evaluated for possible preservation. The local Indian tribe will be consulted if a site appears to have religious or historical significance.

Protection of the cultural resource usually will have little effect on Forest outputs, but may increase the cost of some activities if the site must be excavated or the project redesigned to avoid the site. The identification of the cultural resource can be of economic benefit to the surrounding area by inducing tourists and others to visit these sites once they are protected, interpreted, and publicized. Protection of some cultural sites and areas used for religious practices by Native Americans is critical for the preservation of their heritage. The effects of oil and gas development, range management and timber management on the cultural resource are discussed under each of those activities.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The protection given to historic and prehistoric sites may have a slight effect on long-term productivity. The vegetation on some of these sites may not be available for grazing or lost altogether because of excavation. Protection of the site may also preclude development of facilities, such as livestock water tanks or oil storage tanks, needed for resource management of the area. Even though cultural surveys will be made prior to ground disturbing activities, these surveys may not always be successful in finding a cultural resource prior to the time the activities occur. Should this happen, the ground disturbing activity will be delayed while the area is inventoried and mapped. Analysis of the results of this inventory may show that the activity needs to be diverted away from the site or that the cultural resource needs to be collected and/or cataloged before the activity proceeds. This can cause delay and, if the area is to be completely protected, can reduce the long-term productivity of the site.

Irreversible and Irretrievable Commitment of Resources

In areas where the cultural resources required the elimination of all other activities, the vegetative resources will be irreversibly committed to the

TABLE IV-7
DISPERSED RECREATION ENERGY CONSUMPTION

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
(Millions of gallons of gasoline)																			
Decade 1	.32	.33	.34	.27	.34	.35	.34	.34	.34	.33	.30	.33	.32	.32	.29	.34	.33	.33	.29
Decade 3	.55	.51	.54	.52	.53	.54	.54	.54	.53	.52	.47	.50	.48	.48	.42	.53	.52	.52	.43
Decade 5	.65	.59	.63	.61	.62	.62	.62	.62	.61	.61	.55	.58	.56	.50	.55	.61	.61	.61	.49
Decade 7	.73	.64	.69	.67	.67	.67	.67	.68	.67	.66	.60	.63	.61	.61	.53	.67	.66	.65	.54

protection of the cultural resources. The vegetation grown on these sites (timber or forage) represents an irretrievable loss.

Adverse Effects Which Cannot be Avoided

Activities that threaten cultural resources will be halted until an adequate survey and analysis is made, minimizing any loss, but possibly increasing the cost of the disturbing activities. Surveying activities, such as excavating, sifting and washing soil, and crew campsites, often create a surface disturbance if their own, possibly causing visual impacts, vegetation loss and soil erosion. These are very localized impacts.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

The management of the cultural resource has some effect on other planning efforts, such as land exchanges or mineral development areas by encumbering the implementation of such efforts. The overriding nature of the laws governing cultural resources forces it to be considered in nearly all activities.

Energy Requirements

Managing the cultural resource will require little energy expenditure. Some vehicle travel will be necessary in the surveys and some energy may be used excavation or cataloging sites that are located. This energy will be only a minor portion of the total Forest expenditure.

H. Threatened and Endangered Plant and Animal Species

There are no known threatened and endangered plant species on the Custer National Forest. There is a significant number of Category 2 plants (species to be investigated for Federal listing) occurring on the Forest. A list of these plants can be found in Appendix VII of the Forest Management Plan.

Threatened and endangered animal species listed for the Custer National Forest include:

Grizzly Bear
Bald Eagle
Gray Wolf
Black-footed Ferret
Peregrine Falcon
Whooping Crane
Interior Least Tern
Piping Plover

Grizzly bears are known to seasonally use portion in and around the Absaroka-Beartooth Wilderness . Within the Wilderness, there are no Management Situation (occupied suitable habitat) acres and 103,724 acres of Management Situation II (unoccupied suitable habitat). Outside the Wilderness are 5,507 acres of Management Situation I and 1,280 acres of Management Situation II. See the Glossary for further definition of MS I and II and the additional discussion of the grizzly bear habitat in Chapter III, Affected Environment of this document. These areas are treated the same in all alternatives and no conflicting uses are scheduled. Direction for coordinating other uses in this areas is provided by the document "Guidelines for Management Involving Grizzly Bears in the Greater Yellowstone Area" and the Custer Forest Management Plan. A major consideration in the Preferred Alternative, Alternative 10 is the Forest's intent to recommend withdrawal of all minerals from entry for the MSI portion.

Peregrine falcons are suspected to occur in the Lost Water Canyon portion of the Pryor Mountains (Montana). This area is recommended for wilderness classification in most alternatives and the Forest will support reintroductions of falcons into this area. In addition, 120,000 acres around the Stillwater River (Beartooth Mountain-Montana) drainage were designated as essential habitat for peregrines. This area is protected in all alternatives from disturbing activities, including leasing stipulations for oil and gas activities.

There are 41,500 acres of essential habitat for bald eagles on the Forest, primarily in North Dakota. The Forest also has an active winter roost area in the Montana portion of the Sioux Ranger District. The most threatening activity is considered to be oil and gas development, but seasonal restrictions for any disturbing activity have been developed to protect the sites.

There is a possibility that the gray wolf may use a portion of the Beartooth Ranger District (Montana). There is little area on the Forest that could provide the needed winter habitat.

Black-footed ferrets may occur on the National Grasslands. There have been no substantiated observations in the last 25 years. Because prairie dog towns provide necessary habitat for the ferret, all projects that have the potential of affecting the towns will be surveyed for black-footed ferrets prior to project implementation.

Whooping cranes overfly the Little Missouri National Grasslands (western North Dakota) on their migrations in the spring. While no observations have been made of these birds on the LMNG, they could use some of the stock ponds as resting areas. This potential use is acknowledged by all management activities adjacent to the ponds.

There are no known reports of interior least terns on the Forest. Habitat for the birds consists of relatively large sandbars, isolated from the shoreline. This is not abundant on the Forest, but may occur along the Little Missouri River in North and South Dakota.

There are no known reports of piping plovers on the Forest. Habitat for the bird consists of bare,

dry sandy areas along streams and lakes. A minimum of suitable habitat exists on the Custer, generally along or near the Missouri and Little Missouri Rivers.

Further information can be found in Chapter III, Wildlife and Fisheries Section of this document and Appendix VII of the Management Plan for the Custer NF.

The alternatives considered in this Environmental Impact Statement recognize the unique needs of the threatened and endangered animal species. In no case, does an alternative propose any detrimental or inhibiting activities to the maintenance or recovery of these species. There is no diffference in this management among the alternatives.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The short-term use is to protect the habitats for these species and to increase the long-term quality of the habitats where possible. Some restrictions on other activities may be necessary to protect these species and this may mean a loss of some resources or reductions in others. Because prairie dogs provide the needed habitat for black-footed ferrets, a forage loss may occur as the prairie dog towns expand and decrease the forage productivity. Similarly, a reduction or removal of recreationists in MSI and II areas (to favor grizzly bears) would result in a lost opportunity. Locatable mineral resources under MSI area will be recommended for withdrawal, creating an adverse impact to the long-term mineral productivity.

Oil and gas development could be somewhat hampered by the seasonal restrictions placed on activities in the bald eagle essential habitat. However, the long-term productivity of the area to produce these species will be protected or enhanced.

Irreversible and Irretrievable Commitment of Resources

The identification of MSI and II lands does constitute an irreversible commitment of resources. The 5,507 acres of the MSI for the grizzly bear in the Absaroka-Beartooth Wilderness is committed to bear management for the plan period (10-15 years). As long as the bear is classified as threatened or endangered, these lands will be managed for its habitat. Resources opportunities, such as livestock grazing or recreation experiences, could be irretrievably lost until such time the classification is changed or dropped. The mineral resources, under the MSI lands when formally withdrawn will be held in abeyance until the classification is changed or dropped. Formal mineral withdrawal is made for a 20-year term or less depending upon the decision of the Secretary of Interior or Congress as detailed by Federal Land Policy and Management Act of 1976 (PL 94-579).

The designated essential habitat for the threatened and endangered species can be reversed if no animal occupation or use is determined. Until such time, developmental costs and time could be extended to be in alignment with timing restrictions. If and when, individuals of the threatened or endangered species are discovered and verified, the decision to manage for their habitat is irreversible with irretrievable losses until suitable recovery has occurred and the specie is no longer on the Federal list.

Adverse Effects Which Cannot be Avoided

Impacts to other resources are likely to occur as a result of grizzly bear management. Recreation use may be limited or not allowed to allow bear recovery. Grizzly bear/human encounters have been known to result in death to humans and/or animals. Grizzlies are also know to feed on carrion of wild or domestic animals, as well as live animals.

If a black-footed ferret is discovered and prairie dogs are allowed to expand, the disturbance to range productivity can not be avoided as long as the black-footed ferret is classified. Because the likelihood of peregrine falcon occupancy is high in certain areas of the Forest, the seasonal restrictions on disturbing activities, especially oil and gas development, could result in higher costs and delays to industries. The similar restrictions for bald eagle and other threatened and endangered species would apply only if individuals are found.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

As discussed above, grizzly bear, peregrine falcons, bald eagle, and possibly the other listed species considerations would likely conflict with some land management plans, particularly mining or energy development. Livestock grazing plans, especially in the National Grasslands, must coordinate with needs of the black-footed ferret and prairie dogs (food source).

The Forest is a cooperator in the Interagency Grizzly Bear Committee in the management of grizzly bears and their habitats in the Greater Yellowstone Ecosystem. Coordination and cooperation with all forests in the ecosystem has been maintained throughout the planning process to insure the continued conservation of this animal. The Forest also cooperates with other agencies and interest groups, representing threatened and endangered species.

Energy Requirements

The only energy requirements associated with threatened and endangered species at this time are for field surveys and administration of restrictions.

I. Wildlife Habitat

Management of wildlife on National Forest System lands is a joint effort among the various States and the Forest Service. By law, the animals are owned by the State, and it has the authority and responsibility to manage wildlife populations. The Forest Service has the authority and responsibility to supply and manage wildlife habitats on National Forest System lands. Major interest species on the Custer are: elk, mule deer, white-tailed deer, bighorn sheep, pronghorn antelope, sharptail grouse and prairie chicken. See Chapter III for a listing of habitat indicators and further discussion. Of particular public interest is the relationship of wildlife habitat and management with the Greater Yellowstone Area. The elk herd that occupies Line Creek (Beartooth Ranger District, Montana) is not known to migrate into Yellowstone National Park and usually winters in lower elevations. The grizzly bear habitat is critical to coordinate within the Greater Yellowstone Area and the Custer National Forest's policy has been and will continue to be in alliance with the Greater Yellowstone Grizzly Bear Guidelines. See Section H, Threatened and Endangered Species section of this chapter for more discussion.

Because wildlife populations are directly related to the quality and extent of the habitats provided, the Forest Service and State agencies coordinate their activities with the needs of wildlife and fish. This coordination has no direct effect on the environment, but results in recommendations and activities that benefit wildlife or minimize adverse effects.

Wildlife management on the Forest can be divided into two parts; coordination and improvement. Through coordination, wildlife habitat needs are considered when other activities are proposed and can be protected or enhanced. Coordination is the highest priority of wildlife and fish management on the Custer National Forest. Table IV-8 shows the acres designated to wildlife emphasis.

Coordination is provided for in area planning, in conjunction with planning for the development of expected oil and gas areas to minimize the impacts on wildlife. Through area development analyses, key wildlife areas are defined and, where possible, avoided by development. Identification of these key areas is very important, and often controlling, in developing a transportation system for the area.

Other effects of such coordination on other resources can include reducing timber sale size or volume harvested, locating roads in less sensitive areas (non-key habitats), seasonally restricting road uses or oil development activities and reducing livestock grazing pressures. These activities' effects on wildlife are discussed under the individual activity.

Table IV-8, Acres Designated For Wildlife Emphasis, indicates a theme of management that recognizes and actively manages the wildlife habitats. Other activities are accommodated, however, limited adverse effects to habitat are allowed. Livestock grazing, mineral development and timber harvest continue across the Forest but their impacts to wildlife are either tolerable, highly mitigated or avoided. Seasonal restrictions or no surface occupancy may apply to oil development.

Alternative 1, true to its objective, designates the greatest acreage to wildlife management. Livestock grazing and oil development is likewise reduced to accommodate the wildlife concerns. A moderate timber program is scheduled to stimulate browse vegetation and create diversity in needy areas. Alternative 8 designates the least acres of the alternatives because of the extensive minimum level management necessary to meet the budget.

The differences between Alternative 6 and Alternative 10 (PA) show the changes made in land allocation based on public comment on the Draft EIS.

Proposed acreage of wildlife habitat improvement by alternatives and acreage are displayed in Table IV-9.

Habitat improvement consists of projects that are designed to increase the quality or quantity of habitats for wildlife. There are two general types of projects: (1) nonstructural methods which are designed to improve the vegetative diversity, and (2) structural methods which provides either natural or artificial habitat improvements, such as goose nesters, snags, and brush piles.

Alternative 8 provides the least emphasis on wildlife habitat improvement of all alternatives. Alternative 1 places the most emphasis on wildlife of all alternatives and therefore has the most acres of wildlife habitat improvement.

TABLE IV-8

ACRES DESIGNATED FOR WILDLIFE EMPHASIS BY ALTERNATIVE

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Wildlife emphasis acres (M acres)	1262	94	349	307	135	98	121	133	240	148	114	94	89	70	1	241	336	230	0

TABLE IV-9
WILDLIFE HABITAT IMPROVEMENT ACRES BY ALTERNATIVE

	Alternative/Benchmark																PA	MAX	MIN
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10	PNV	LVL
Wildlife habitat improvement		Acres																	
Decade 1	1252	992	720	757	688	688	722	689	605	606	575	476	477	451	10	647	344	469	00
Decade 3	2922	1513	1368	1412	1136	1171	1206	1171	1002	999	969	726	725	576	60	1132	876	822	00
Decade 5	3914	1983	1764	1826	1447	1481	1584	1481	1362	1302	1241	927	927	902	100	1456	1408	1056	00
Decade 7	4749	2348	2088	2204	1722	1756	1860	1756	1604	1513	1453	1052	1077	1052	120	1715	1826	1244	00

There are a number of areas on the Forest that are assigned to the roadless category (see Table IV-2) or are otherwise restricted for other uses to protect critical wildlife areas. Several areas on the Little Missouri National Grasslands are defined as roadless for the protection of deer, elk, and bighorn sheep. There are also areas on the Beartooth and Ashland Ranger Districts that are protected from development and intensive management to protect key wildlife values. In some areas, timber harvest is prohibited or restricted, and in others grazing by domestic livestock is limited or eliminated to benefit wildlife.

Habitat improvements are most desirable when they improve the vegetative diversity on the Forest. For instance, aspen stands are limited on the Forest and many wildlife species use stands for food or shelter. With the fire suppression activities over the last 50 years, the pine stands have grown and shaded the aspen, stifling their growth and reproduction. Removal of overstory pine can stimulate the aspen, especially when a method is used to increase aspen sprouting, such as clearcutting and burning. This situation is typical of the Sioux Ranger District in Montana and South Dakota.

Habitat improvements on rangelands involve improving vegetative diversity and condition through seeding, brush planting, water developments or fencing. The principal goal is to improve or maintain the woody draws and improve diversity in the grasslands.

A wide variety of nongame wildlife occurs on the Forest and they are dependent upon a broad spectrum of habitats. Activities to directly manipulate nongame habitat are snag creation and vegetative manipulation.

The specific activities associated with wildlife habitat improvement will not make a measurable effect on the economic base or lifestyle of the area because of the few acres affected. Areas throughout the Forest are well known for big game and upland bird hunting. However, most of the effort to maintain and improve wildlife habitat is through coordination with other resource management activities.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Wildlife habitat management activities, such as designing timber harvest systems to benefit wildlife, may prevent the Forest from realizing the maximum timber production in the next rotation period. Oil and gas development and livestock grazing can be limited or eliminated for wildlife consideration. Habitat diversity will be maintained or improved and the quantity and quality of wildlife habitats will be improved. Visual resources and recreation opportunities usually benefit from wildlife management activities.

Irreversible and Irretrievable Commitment of Resources

Committing acreage to wildlife is a reversible decision, pending further analysis and public comment. The Forest Management Plan would be amended or revised to reflect any changes in policy. This commitment to wildlife habitat management restricts or prohibits other resource activities and creates some irretrievable losses. As an example, the excess forage produced in a restricted area not used by wildlife or livestock is irretrievably lost. This forage may be utilized by bird species as nesting habitats, recycle, and be incorporated into the soil within a year or two. The actual loss of the forage is not significant, but the loss of the grazing opportunity to the livestock industry may be. Live and dead trees left to benefit wildlife for nesting, cover and feeding are irretrievably lost from utilization as wood products.

Adverse Effects Which Cannot be Avoided

As timber is managed primarily for desired wildlife habitat by allowing stands to reach old growth stages, the marginal economic value (in terms of wood products) is adversely affected. Similarly, if stands are harvested prior to maturation to create openings or diversify the timber cover, a theoretical economic loss is incurred.

The reduction of livestock grazing will result in an adverse effect to the affected ranching operation, i.e. displaced livestock or herd reductions.

Mineral resources, primarily oil and gas, will be adversely affected by being withdrawn or seasonally restricted to avoid sensitive periods, such as nesting, breeding or fawning.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

Conflicts have occurred and are expected to continue among various industries dependent upon National Forest System lands and could be adversely affected or at least interrupted by intensive wildlife management (see discussion above). Although coordination is the utmost concern, differing opinion and management philosophies exist among the agencies concerned with wildlife management. Coordination has been maintained with the BLM which administers land adjacent to the Forest to assure consistency of habitat management as well as with the North Dakota, South Dakota and Montana departments of fish and game in the development of management direction for the Forest Plan.

Energy Requirements

Energy requirements for implementation of wildlife habitat improvement or protection activities are very small. The constraints placed on a project to mitigate damage to habitat may increase the normally expected amount of energy.

J. Fish Habitat

The Custer National Forest provides a wide diversity of fisheries. Coordination and division of responsibilities are the same as discussed in the Wildlife Section above. High mountain streams and lakes support many cold water trout species and the small impoundments, ponds and larger rivers in the pine hill and grasslands support numerous warm water species, such as large and smallmouth bass. There are 3,713 acres of lakes and 333 miles of streams considered fishable. Fish management incorporates both coordination and habitat improvements. Coordination is designed to assure that fish habitat needs are incorporated into project activities. Coordination with the State Fish and Game Departments of Montana, North Dakota, and South Dakota is required to insure that stocking plans and rates are consistent with Forest activities.

Habitat improvements are designed to increase the quantity and quality of fish habitats, consisting of projects such as installing logs, boulders, and check dams in streams to improve pool area and provide cover; riprapping shorelines for stabilization; fencing and reseeding surface disturbances in riparian areas to reduce fine sediments and maintain stream banks; maintaining tall vegetation cover along streams to provide for cover; and installation of sediment control devices in the drainage above stock dams. There is little need for increasing fish passage, migration or habitat in many of the Forest's streams because the majority of the cold-water streams are within the Absaroka-Beartooth Wilderness and flow through areas with few planned management activities. Project work would be done on streams lying outside of the Wilderness. Table IV-10 indicates the differences in habitat improvement among the alternatives.

Fisheries management is considered a part of the wildlife/fisheries program on the Forest. Therefore, the wildlife emphasis alternative (Alternative 1) provides for the most fish habitat improvement and Alternative 8 provides for the least due to the limited funds for fish habitat improvement. All the remaining alternatives are not far below the level called for by Alternative 1.

As a result of habitat improvement, the estimated number of catchable fish changes. Table IV-11 displays these changes. The estimated catchable fish in 1980 was 428,700.

There are insignificant environmental consequences associated with fish habitat improvement. Temporary stream clouding could occur in conjunction with structural improvements to the water course. Retaining vegetation along streams and lake shores is considered a beneficial action to most all environment components. Some livestock grazing could be displaces in areas fenced to protect water quality. Livestock access to fishing ponds could be confined to one area by fencing. The consequences are not considered to so great as to reduce or eliminate livestock grazing.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The quality of the cold-water fisheries is currently very high, as most of these streams flow through the Absaroka-Beartooth Wilderness where few, if any, disturbing activities occur. Warm-water fisheries have the greatest potential for increase on the Forest. The long-term potential of these fisheries will increase through protection of the existing habitats and development of improvement projects, such as deepening ponds and controlling sedimentation. The fishery program will not be detrimental to other resource programs.

Irreversible and Irretrievable Commitment of Resources

As ponds and reservoirs are improved for fisheries habitat, they become committed to provide a continuing fisheries. This decision could be reversed and improvements removed, but it is unlikely.

Adverse Effects Which Cannot be Avoided

Stream or pond bottoms will be disturbed in the immediate area when improvements are built, such as sediment barriers or shoreline riprap. This may have minor short-term effects on the fish and insects which occupy these areas, but the effects are unlikely to persist more than one year. Livestock grazing could be displaced when reservoirs are fenced to protect riparian vegetation growth.

TABLE IV-10

FISH HABITAT IMPROVEMENT ACRES BY ALTERNATIVE

	Alternative/Benchmark																PA	MAX	MIN
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10	PNV	LVL
Fish habitat improvement	Acres 1980			Base = 0 Acres															
Decade 1	28	22	24	26	24	24	25	24	24	24	22	22	22	21	3	24	24	21	00
Decade 3	66	34	45	28	39	40	41	40	41	39	38	34	34	27	6	41	41	41	00
Decade 5	88	45	58	62	49	51	54	51	53	51	48	44	44	42	10	53	53	53	00
Decade 7	107	53	68	75	59	60	64	60	62	59	57	49	51	49	15	62	62	62	00

TABLE IV-11

CATCHABLE FISH BY ALTERNATIVE

	Alternative/Benchmark																PA	MAX	MIN
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10	PNV	LVL
Catchable Fish	M Fish																		
Decade 1																			
Streams	47.5	43.6	46.1	46.8	46.4	46.5	46.7	46.5	46.3	46.4	46.4	43.7	43.7	43.7	46.7	46.3	46.8	46.1	48.8
Warm Water	29.1	25.5	26.3	27.6	24.3	26.6	25.7	25.2	24.8	24.8	24.6	24.2	24.2	24.1	22.9	25.2	24.8	25.4	22.9
Lakes	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3
Total Decade 1	432.9	425.4	428.7	430.7	427.0	429.4	428.7	428.0	427.4	427.5	427.3	424.2	424.2	424.1	425.9	427.8	427.9	427.8	428.0
Decade 3																			
Streams	53.5	50.7	53.3	53.4	53.3	53.3	53.3	53.3	53.3	53.3	53.2	50.7	50.7	50.7	50.1	53.3	53.4	53.1	48.8
Warm Water	31.2	27.2	27.5	29.6	26.1	28.4	27.6	27.0	26.6	26.6	26.3	25.8	25.8	25.7	23.2	27.0	26.6	27.0	22.9
Lakes	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3
Total Decade 3	441.0	434.2	437.1	439.3	435.7	438.0	437.2	436.6	436.2	436.2	435.8	432.8	432.8	432.1	429.6	436.6	436.3	436.4	428.0
Decade 5																			
Streams	53.5	50.7	53.3	53.4	53.3	53.3	53.3	53.3	53.3	53.3	53.2	50.7	50.7	50.7	50.1	53.3	53.4	53.1	48.8
Warm Water	31.2	27.2	27.5	29.6	26.1	28.4	27.6	27.0	26.6	26.6	26.3	25.8	25.8	25.7	23.2	27.0	26.6	27.0	22.9
Lakes	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3
Total Decade 5	441.0	434.2	437.1	439.3	435.7	438.0	437.2	436.6	436.2	436.2	435.8	432.8	432.8	432.7	429.6	436.6	436.3	436.4	428.0
Decade 7																			
Streams	53.5	50.7	53.3	53.4	53.3	53.3	53.3	53.3	53.3	53.3	53.2	50.7	50.7	50.7	50.1	53.3	53.4	53.1	48.8
Warm Water	31.2	27.2	27.5	29.6	26.1	28.4	27.6	27.0	26.6	26.6	26.3	25.8	25.8	25.7	23.2	27.0	26.6	27.0	22.9
Lakes	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3	356.3
Total Decade 7	441.0	434.2	437.1	439.3	435.7	438.0	437.2	436.6	436.2	436.2	435.8	432.8	432.8	432.1	429.6	436.6	436.3	436.4	428.0

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

There are no conflicts with fish habitat improvement projects and land management plans of the adjacent areas. Fish projects, particularly warmwater opportunities, will be coordinated with Allotment Management Plans and appropriate state agencies.

Energy Requirements

Some energy will be required to install in-stream structures to enhance pools and riffles or to deepen ponds or reservoirs. This will be a very minor portion of the total energy use of the Forest.

K. Fire Suppression

The purpose of fire suppression is to minimize damage to valuable resources by controlling and extinguishing fires. In the period from 1970 to 1979, there were 591 fires on the Custer National Forest, 85 percent were lightning-caused, and the other 15 percent were person-caused. The extent of fire suppression activities depends on the fire starts and weather, rather than alternative objectives, and were not analyzed by the alternatives.

Additional information on fire and fire history can be found in Chapter III.

The Forest has stands of ponderosa pine and lodgepole pine that have different relationships to fire. Fire is common in ponderosa pine types. Periodic low to moderate-intensity fires in ponderosa pine thin young stands and retard the encroachment into adjacent areas. In mature stands, fire creates a seedbed for regeneration of a new stand. Aggressive fire protection in the moist ponderosa pine type has permitted development of dog-hair stands that eventually stagnate.

Lodgepole pine is generally a fire-dependent species. Fire is needed to open the cones and permit seed dispersal, to prepare the seedbed, and to reduce fuel loading. Lodgepole pine matures at a relatively young age and may be killed by light to moderate surface fires, unlike ponderosa pine. Timber harvest and forest fuels management can reduce the fuel loading, provide fire breaks, and remove mature and overmature timber before a fire consumes it.

The mixed conifer stands on the Forest are composed of a variety of species including Douglas-

fir, Engelman spruce, and subalpine fir. These species all have different responses and associations with fire. Some of these mixed conifer stands grow in environments that have very low fire frequencies, although old-growth Douglas-fir is quite fire-resistant.

Periodic fires benefit aspen stands through increasing sprouting and removing competing stands of pine. Fire suppression efforts through the years have allowed the ponderosa pine stands to overshadow the aspen stands, causing a decline in the vigor and abundance of aspen, especially on the Sioux District in eastern Montana and western South Dakota.

Fuel loading on grassland types is much lighter than in timbered areas, but grass fires can consume large acreages in a short time. Frequent grass fires alter range species composition, and a lack of fire results in a heavier than normal litter accumulation, likewise allowing the vegetative composition.

Riparian areas are often wet enough that they will not burn except in extremely dry years. Most shrub and tree species associated with riparian areas are thin barked and easily killed by fire, although many such areas often recover quickly, and a new vigorous stand may result from periodic fires.

Successful long-term suppression has a favorable effect in areas where timber management is prescribed because it protects the stands from burning. Suppression also permits in the establishment of old-growth forests, favoring old-growth dependent species (such as the goshawk) and providing thermal cover to large species such as elk or deer. Forage is eliminated or suppressed by competition and shade of old-growth.

Protection from burning also leads to the accumulation of fuels (above natural levels) and can result in large damaging fires. Excessive heat generated by fires in dense, dry fuels can adversely affect vegetative productivity and soil stability. Stream sedimentation is likely to occur after a hot litter-and humus-consuming fire exposes soil to erosion and subsequent water run-off occurs (USDA Forest Service, 1978).

Because fire is one of nature's methods of controlling or reducing insect and disease infestations, fire suppression can create conditions conducive to an increase of insects and disease. As a result, the dead and dying trees contribute to greater fuel accumulation and fire hazard. Extensive tree kills result in severe fire hazard conditions which may last for many years.

During fire suppression activities, fireline construction with hand tools or heavy equipment can increase the potential for soil erosion. To eliminate fuel, firelines are dug to expose mineral soil which make it susceptible to erosion. The placement of a fireline across a slope or up-and-down a slope creates different amounts of erosion. The location of fireline is determined by the fire suppression strategy, not the susceptibility of the soil to erosion. The potential for soil movement is increased by use of heavy equipment on steep slopes or on soils.

Short-term Use vs. Maintenance and Enhancement of Long-tern Productivity

Effective fire suppression will protect the current crop of trees, Forest Service facilities and personal property throughout the Forest. If practiced on any one site for too long, it will induce a change in vegetative composition and density which may or may not affect productivity. Fire protection may create situations where dry fuels are so abundant that fires are difficult to control. Overall, fire suppression generally maintains productivity and enhances the possibility that trees can be harvested at the appropriate time.

Fire on rangelands provides additional nutrients to the soil in the form of ash which is beneficial to some soils. The loss of the current year's forage production can adversely affect wildlife and livestock producers' operations.

Irreversible and Irretrievable Commitment of Resources

Since it is unlikely that fire suppression efforts will be halted, it is an irreversible commitment of human, equipment and financial resources. By continuing to suppress fires, the historic fire patterns will continue to be interrupted.

Adverse Effects Which Cannot be Avoided

Some loss of soil due to construction of firelines will occur despite care in location and preventive measures. Buildup of fuels will continue in areas protected by fire suppression. When fires occur, consumption or alteration of resources is unavoidable.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

Smoke created by wildfires may at times cause local air conditions to exceed the air pollution standards established by various State and Federal laws.

Energy Requirements

Energy required in the fire suppression program is dependent on the number, location, and size of fires. They are unpredictable for the scope of this analysis. In severe fire years, this use can be a substantial portion of the total energy expended by the Forest. Energy-consuming equipment includes fixed-wing aircraft, helicopters, air and ground tankers, bulldozers, personnel carriers, pumps, chainsaws, and other internal combustion engines.

L. Managed Fire

Managed forest consist of two types of ignitions, planned and unplanned. In either case, a predetermined plan is required (a prescription) for an area where burning would be appropriate to meet a desired goal, such as site preparation for timber regeneration or shrub/aspen/birch stimulation (wildlife habitat). Managed fire can also be used to improve forage or control slash following harvest.

Management of unplanned ignitions is currently included in the management direction for the Absaroka-Beartooth Wilderness. This direction is constant for all alternatives. The same option is available for proposed wilderness areas and roadless areas managed for semi-primitive recreation. However, a fire management plan would have to be developed to define the requirements and constraints to be used in each such area.

Managed fires increase forage production for big game. They may also temporarily alter the habitat of other animals and birds by improving habitat for those which prefer open areas and degrading habitat for those which prefer dense vegetation. Because of this, managed fire tends to increase vegetative and animal diversity. At the same time, the burned area degrades the visual landscape for a short period of time until new plant growth screens the effects of fire. In the process of burning, accumulated fuels are consumed. This can reduce the severity of future fires.

Managed fires are seldom so hot that everything, overstory and understory, is consumed. Fires attaining this magnitude are usually suppressed. Even so, soils are exposed to run-off and this can result in lowered water quality for a short period of time.

Because a managed fire can burn for long periods of time, air quality can be adversely affected during these periods. The effect is likely to be less intense, at any one time, than with large intense wildfires. Reduced air quality should be similar to that produced by fires ignited for specific purposes such as on wildlife range, on livestock range, and for slash control.

The Forest has the potential to substantially increase the use of managed fire as an effective tool in the fuels management, pine encroachment in grassland ecosystems, forage improvement, vegetation management in wilderness, timber management, wildlife habitat improvement, and providing ecosystem diversity. The extent of managed fire use depends upon budgets and management practices. Proposed programs include 400-500 acres burned annually for fuel treatment and 500-1,500 acres for range improvement. Historical evidence indicate that fires have always been an ecological force in ponderosa pine communities. Aspen stands can be regenerated through managed fire. Lodgepole pine need hot fire to open their serotinous cones to release seeds. Old-growth Douglas fir is quite fire resistant (see discussion above under Fire Suppression or Chapter III under item 14, "Protection" for more details).

The amount of managed fire is not projected in the alternatives. Site-specific analysis will be made at the time of prescription development, tiered to this disclosure.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Allowing a fire to burn can have a long-term effect on the kind of vegetation and animals occupying the area. A future generation of the overstory (trees or shrubs) may be entirely destroyed. Some of the present understory, especially shrubs, is completely removed. Depending upon the intensity of the fire, native productivity is may not be destroyed and, in fact, may be temporarily enhanced by the availability of the minerals in the ash.

In some areas of the National Grasslands, fire is a common management tool. There are wet areas that produce very heavy, lush vegetation that will not be used by livestock unless the area is mowed or burned. By burning, the lush unpalatable vegetation is removed, the grass puts up new growth, and the long-term productivity is enhanced. In other grasslands, fire has been a recurring natural force that revitalizes many plant species and destroys others.

Irreversible and Irretrievable Commitment of Resources

A proposal to allow a fire to burn is not irreversible, but the resources destroyed during the time between making that decision and reversing are irretrievable. Analyses are made prior to or at the time of ignitions to decide whether a particular fire should or should not be suppressed. This decision can be changed at any time and suppression initiated or halted. Control may not be possible if weather conditions turn unfavorable. In that situation, the decision to ignite a fire or allow one to burn could be considered irreversible. If the fire is allowed to burn, the consumed material is irretrievable. Extreme caution is required in making these kinds of decisions regarding forest resources.

Adverse Effects Which Cannot be Avoided

The aftermath of the fire will remain visible for a period of time. Again, the length of time that the effects are visible depends upon the size and intensity of the fire. Soil is bared and a small amount of soil movement may occur which could lower water quality. Smoke will be dispersed into the atmosphere. Habitat for some animals and birds will be temporarily destroyed.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

Smoke created by fire may exceed State and Federal clean air standards or guidelines for a short time.

Energy Requirements

Some energy will be consumed in monitoring a managed fire, but is minor portion of the total Forest use. If conditions change and suppression is warranted, energy consumption could be significant. This amount is not feasible to project.

M. Utility Transportation Corridors

An analysis of the Forest's lands was made in 1982 to define the kinds of land which should be avoided in permitting the construction of linear right-of-way utility lines, oil and gas pipelines, and communication lines. The analysis is based on information contained in the Pacific Northwest Long Range East-West Energy Corridor Study, Phase 1 (draft), Part A-Rocky Mountains, Part B-Cascade Mountains, Bonneville Power Administration, December, 1977. The study inventoried existing facilities and potential corridor locations. Guidance for the Forest inventory is contained in a Region 1 letter to the Forest Supervisor on Corridor Planning Guidance, 1990 Special Plans and Studies, dated October 7, 1982. Primary factors controlling corridor segments through the Rocky Mountain passes were topography, geologic stability, and seasonal access. A potential corridor (R-33) was located along the southwest boundary of the Beartooth District at Red Lodge, Montana. The area containing the proposed corridor had been classified as the Absaroka-Beartooth Wilderness by Congress in 1978 and became a corridor exclusion area.

The Northern Border Pipeline across a small portion of the McKenzie District in the Little Missouri National Grasslands (western North Dakota) could be designated as a utility corridor and additional lines constructed.

Proposed corridors, as analyzed in this document, in themselves have no impact on an area. Only when these corridors are occupied does the impact occur. Prior to construction of a utility line or oil and gas pipeline, an appropriate analysis is required to establish the final location of the facility and its supporting road. At that time, the effects of the facilities would be displayed.

No projections of corridor development was made in the alternatives.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The existence of an unoccupied corridor has no effect on long-term productivity.

Irreversible and Irretrievable Commitment of Resources

The identification of the corridor is not an irreversible or irretrievable commitment of resources. However, as long as the corridor does not cross identified exclusion areas, the possibility of occupation by a utility does exist.

Adverse Effects Which Cannot be Avoided

Until occupation occurs, none are identified.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

None identified other than the classification of the Absaroka-Beartooth Wilderness.

Energy Requirements

None while the corridor is unoccupied.

N. Watershed Improvement and Maintenance

The Forest has a relatively small watershed program, as compared to the watershed needs. An inventory was conducted in 1981-1982 for needed watershed projects needed on the Forest. Some of the backlog projects include reclamation of uranium spoils, reclamation of chrome mines and mine tailing, stabilization of stream channels and head cuts, and range related projects. Project costs would total about $14 million. When funding becomes available, projects will be implemented and would not vary significantly among alternatives. Current activities include range-ripping (an aid to water retention and utilization) on the Ashland and Grand River Ranger Districts and watershed protection measures in road designs. Specific projects are mostly designed to improve or maintain water quality. Effects would range from lessening soil erosion to stopping pollution from old sites and tailings. Each project will be subjected to analysis prior to initiation, and the effects will be identified.

There is no "designed" emphasis on watershed improvement and maintenance in any of the alternatives, although the cost of the program was integrated into all budget needs. Alternatives 2, 3, 7, 7a and 7b which emphasize commodity goods would tend to create greater watershed needs due to road building, oil development and timber harvest. Other alternatives with objectives stressing noncommodity would likewise require watershed program funds because of the emphasis on rehabilitation and protection of land (nonmarket) values.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The intent of the watershed program is to enhance long-term productivity of the Forest

lands. The projects are undertaken on lands previously disturbed. Existing soil erosion and stream sedimentation will be reduced. Vegetation will be established on mine and tailing sites.

Irreversible and Irretrievable Commitment of Resources

None identified.

Adverse Effects Which Cannot be Avoided

When working in streams to stabilize channels and remove debris, the stream bottom will be disturbed and water quality will deteriorate for a short period of time.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

None identified.

Energy Requirements

Energy will be required to complete the projects and to monitor watershed conditions on the Forest but this will be a small portion of the total Forest use.

O. Insects and Disease

The primary emphasis of the insect and disease program on the Custer National Forest is in treating timber and range insects. The most serious infestation of mountain pine beetle in ponderosa pine occurring on the Forest is found in southern portions of the Long Pines of the Sioux Ranger District. An aerial survey in 1981 showed about 5,000 beetle-killed trees scattered over 10,000 acres. There are limited mountain pine beetle infestations in the lodgepole pine across the Forest. Spruce budworm in Douglas-fir is estimated to occur within approximately 12,800 acres of the Beartooth Mountains (Stillwater River drainage) and 5,000 of the Pryors Mountain (both in Montana).

Dwarf mistletoe, a tree disease, is estimated to occur in slightly less than 30% of the Forest's lodegpole pine stands. Root disease in the timber stands is expected to exist, but has been measured. See Chapter III, the Protection Section for more details.

The Forest surveys about 4,000 acres per year for grasshopper populations. The Forest does not have any control program for grasshoppers at this time. In the past, if population control was needed, the Animal and Plant Health Inspection Service (APHIS) provided this service. This control procedure is further discussed in Chapter III, Protection Section.

The most effective means of integrated pest management on the three forested Ranger Districts (Beartooth, Ashland, Sioux) is through by timber harvest. This can involve a variety of silvicultural systems. The program may involve emphasis on certain tree species, stand composition and spacing as described in the Timber Section of this chapter. In general, a healthy, well-spaced, mixed species stand is less susceptible to damage by insect and disease than an older stand, single-specie stand or a stagnated stand.

Approved pesticides may be used as a method of control in developed recreation sites, but will not be used in the Forest in general. There are no plans for use of pesticides on the Forest under any alternative. Should the occasion arise, such proposals would be subjected to strenuous analysis and environmental consequence disclosure prior to initiation.

The opportunity to treat insect and disease-infested timber is directly proportional to the size of the proposed timber sale program. Alternatives 3, 7, and 7b have the largest timber sale program and therefore offer the most opportunity to remove insect and disease-infested timber by commercial timber harvest.

Insect and disease infestations have the potential for affecting the local economy. If large infestations of grasshoppers occur and controls are not applied, forage for livestock grazing and wildlife habitat is lost. Likewise, if bug-kill or disease in timber stands is widespread, local mills and individual post/pole buyers could suffer a lack of available green timber.

Control efforts do not contribute significantly to the local economy, since these efforts are a part of the regular workload (timber harvest) or, in case of pesticide application use, are short term.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The application of appropriate silvicultural methods to control insects and disease increases the long-term productivity of the Forest's timberland. Applying pesticide is considered a short-term activity to prevent widespread vegetative destruction and to at least maintain the land's productivity.

Irreversible and Irretrievable Commitment of Resources

The only control measure proposed by the Forest involves silvicultural treatment. Selected silvicultural treatment indicates that the new generation of trees will be created and eventually harvested. Committing these new trees to harvest is reversible, but is also a a long-term commitment. Trees killed by insects represent an irretrievable loss of that resource. Forage lost to insects is also irretrievable.

Adverse Effects Which Cannot be Avoided

Silvicultural attempts to control insects or disease may result in alteration of the visual setting by creating harvested areas that could dominate the landscape. Wildlife habitat afforded by the

affected timber stands could be lost for a period of time.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

None identified.

Energy Requirements

Energy required to combat insects and disease by silvicultural means is equal to that of the timber sale program workload.

P. Special Uses

Special uses are activities implemented on NFS lands that are undertaken by someone other than the Forest Service and whose intent and impacts are within acceptable levels. A special use permit contribute to the PNV of the Forest by the fees paid by the permittee. These fees generally offset the administrative costs. Special uses, such as the Red Lodge Ski Area, summer home groups and oil field facilities, contribute significantly to local community economics because of the associated payroll of employees and in tourist purchasing power.

The following section is organized to display the impacts that occur with different types of special use permits. The special uses on the Custer National Forest include roads associated with access to private land and oil and gas developments, electric and telephone lines, pipelines (crude oil, gas, saltwater), summer homes, Red Lodge Ski Area, outfitters and guides, range special uses, microwave sites, hydroelectric dams, and scientific or educational uses. Each of these special uses has its own unique type of impacts and is discussed in the following sections.

1. Special Use Roads

The Forest administers 1,100 transportation and other linear permits. Special use roads within the Forest provide access to private property and to oil and gas leases. Proposed road construction will follow guidelines established in the Forest Transportation Analysis available in the Supervisor's Office, Billings, Montana.

The effects of road construction and maintenance are covered in Section W, Road System of this chapter and are only summarized here. The primary effects are displacement of large amounts of soil, increased vehicle access (traffic) and visual resource impacts.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The vegetation on special use roads is destroyed. Even though efforts may be made to rehabilitate a road, the road bed itself and the cut and fill slopes will not produce as they did prior to the construction. Roads can have long-lasting and severe impact on the visual resource. The access provided by these roads, however, facilitate activities that would otherwise not be possible. Greater land use is accommodated by allowing special use roads on the Forest.

Irreversible and Irretrievable Commitment of Resource

Most roads will likely be maintained into the foreseeable future. Special uses can be cancelled, although this is unlikely for most road permits. Once vehicular access to is provided, it becomes very difficult to deny that access at any given point in the future. The vegetation lost by their existence constitutes an irretrievable loss of resource. Local roads accessing oil and gas wells may be rehabilitated if a dry hole is drilled or if a company abandons a well.

Adverse Effects which Cannot be Avoided

Adverse effects of resulting roads are discussed in Section W of this chapter.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

Access to and within the Forest does not conflict with other plans in the area. Location and construction specifications may have to be coordinated with other resources such as wildlife habitat or water quality to avoid undesirable impacts. State fish and wildlife departments and wildlife interest groups have expressed concern over the the amount of roading and the potential displacement of wildlife.

Energy Requirements

Some energy will be used by the Forest in monitoring special uses and for initial field inspection if needed prior to permit issuance. New road construction will require considerable energy use by the permittee.

2. Pipelines

The Forest administers over 300 permits involving over 900 miles of pipeline for oil, gas, or saltwater transportation. These facilities lie primarily in the Little Missouri National Grasslands (western North Dakota) and support the oil and gas development of the Williston Basin. Pumping stations for oil pipelines and compressor stations for gas pipelines are occasionally needed to transport the production. Saltwater disposal wells are also under permit. Construction of pumping stations and disposal wells usually affects 3 or 4 acres at each site and are not permitted in areas unsuitable for that use. As oil and gas pools loose their natural pressure, pumps are installed to pull the oil from the ground and to push it through the pipeline to its destination. Injection wells may be installed to pump saltwater or gas into the oil producing formation to aid oil extraction. Oil fields in portions of the Little Missouri National Grasslands are currently being injected with saltwater, and gas injection is expected in the

next few years. As gas injection is implemented, additional pipelines will be required to move the gas from gas plants to the oil field.

The major effects of pipeline construction on resources are during the installation. Pipeline installation will cause short-term degradation of visual resources, usually lasting only until the vegetation has become reestablished.

Removal of the vegetation while installing pipelines exposes the soil to wind and water erosion. During intense rainstorms, overland flow can occur, causing rills or gullies on steep slopes. Sedimentation can occur in nearby rivers or streams. In these situations, the Forest will apply proper and timely erosion control measures. Displacement or mixing of topsoil along the pipeline corridor can degrade the soil's fertility. If a pipeline must cross a live stream, the stream bottom can be disturbed and create sedimentation further downstream.

Installing pipelines across roads can damage the road bed and, if compaction is not adequate, drainage problems occur in the road or along the road ditch. Pipelines, where possible, are kept out of the road right-of-way to avoid pipeline damage. When pipelines cross collector roads or highways, a bore hole must be drilled to install the pipeline under the road.

Pipeline corridors are rehabilitated after installation and vegetation reestablished. However, another pipeline may be installed in the same trench or right next to an existing pipeline, or a leak may occur requiring the same disturbance and effects again. Pipeline permits are coordinated when possible so that all the pipelines in one corridor are installed at the same time.

The amount of pipeline to be built is believed to be commensurate with the amount of oil production. Table IV-12 shows the projected cumulative oil production through the planning horizon (75 years).

Alternative 8 would likely result in the least miles of pipelines. Oil production is highest in Alternatives 2, 3, 7 and 7b and associated pipeline construction would respond similarly.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

In most cases some topsoil will be lost or mixed while installing pipelines, which will affect long-term productivity of the soil. If rehabilitation is not successful, sedimentation may run off and lower the water quality. Some erosion will occur on steep slopes and long ditches. Productivity will be lost on location of compressor stations, pumping stations and saltwater disposal wells for the duration of these facilities. After rehabilitation, long-term productivity will probably be less than before the site was disturbed.

The resource development that necessitates the pipelines continues to provide energy resources for the Nation. The productivity of oil and gas is enhanced by pipeline construction. If they were not built, transportation would like be by truck tanker with associated impacts or not at all.

Irreversible and Irretrievable Commitment of Resources

Pipelines under permit will be maintained for at least the next 30 to 150 years. The soil lost during installation is irretrievable. Special use pipeline permits can be cancelled, although this is unlikely.

Adverse Effects Which Cannot be Avoided

Pipeline transportation of liquids (oil and saltwater) and gases is susceptible to accidents, leaks in pipelines and stations, or spills at the saltwater disposal sites.

A gas leak can contain hydrogen sulfide which is a very deadly gas to humans and animals. Each pipeline company conducts periodic inspections to monitor pipelines for leaks, and follows company safety plans to reduce chances of fatalities. Forest Service personnel working in the areas where H_2S gas may be encountered carry gas monitors and life support systems. State agencies, usually a Department of Health or Air Quality, are responsible for monitoring toxic gas emissions. The Forest Service will cooperate to the extent possible with the requirements of air quality standards. Saltwater is quite toxic to vegetation and a spill or pipeline leak may result in soil sterilization. Crude oil or saltwater entering a stream will reduce water quality and adversely affect fisheries.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

Pipeline proposals through roadless areas would not significantly affect the roadless character. However, the associated facilities that pipelines connect (oil wells, oil storage tanks and gas processing plants) would adverse affect the roadless

TABLE IV-12

CUMULATIVE OIL PRODUCTION

(Millions of barrels of oil over a 75 year period)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Barrels of oil	302	345	345	315	334	326	330	331	337	336	332	344	342	331	167	338	316	351	0

character. Because classified wilderness are corridor exclusions, no pipeline would be built in the Absaroka-Beartooth Wilderness. Recommended wilderness areas would be protected until Congressional classification is made or rejected.

Energy Requirements

Some energy will be used by the Forest Service for a field inspection prior to permitting and during installation and rehabilitation.

3. Electric Transmission and Telephone Lines

The Forest administers special use permits for over 800 miles of overhead and underground electric and telephone lines. The primary environmental effects for underground lines are the same as for pipelines, but not as severe because the disturbed areas are not as wide. A major portion of the lines can usually be installed with a single piece of machinery that digs the trench and also lays the line. There would be less vegetation lost and less soil exposed to wind and water erosion than with a pipeline. There is no chance of spills or leaks, but occasionally the lines need to be dug up for repairs. Overhead lines require a cadre of equipment to install the poles (or towers) and hang the line. Installation and maintenance usually require a low-standard access road. Overhead lines also create a greater permanent visual impact than underground lines. Electric and telephone lines require substations for operation, which would be a loss in vegetation for the duration of the station.

No projections of electric transmission or telephone lines are made in alternatives. Any proposal will require a site-specific analysis, tiered to this disclosure.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Construction of overhead or underground lines create a temporary reduction in vegetation cover. Timbered rights-of-way are converted to grass for maintenance and safety. In localized spots, forage production will likely be reduced. Vegetation at substations is lost.

Irreversible and Irretrievable Commitment of Resources

A transmission line permit can be cancelled with due cause. However, it is unlikely that the decision would be reversed. The vegetation lost represents an irretrievable commitment. The conversion of timber to grass is an irretrievable loss of timber production.

Adverse Effects Which Cannot be Avoided

Although efforts are made to reduce the visual impact of an overhead line, the natural landscape is altered. Soil disturbance at overhead towers sites and along underground trenchs will decrease soil productivity. It is unavoidable with these types of installations.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

Before a permit is issued, conflict with other situations is investigated such as private land uses (farming, residential) or other public land uses (wildlife habitat or recreation site).

Energy Requirements

Some energy will be used by the Forest Service for field inspections.

4. Range or Agricultural

The Forest administers 450 agricultural special use permits. These include uses such as ditches, dams, water pipelines, fences, pastures or water wells. The Forest is gradually converting these special uses to be permitted under individual or association grazing permits. There will always be a need for a small number of range or agricultural special uses permits on the Forest. For example, a use that would not be converted to the grazing permit would be a water pipeline or irrigation ditch crossing Forest Service lands. Environmental effects of range management and the associated facilities are disclosed in Section V, Livestock Grazing of this chapter.

5. Recreation Special Uses

a. Red Lodge Ski Area

Red Lodge Ski Area, outside of Red Lodge, Montana, on the Beartooth Ranger District, is situated partly on National Forest System land and partly on private. The area is considered a developed recreation site with numerous facilities, lodges, lifts, parking lots and is administered under a recreation special use permit. It is the closest available downhill ski facility to the city of Billings, Montana (population approximately 100,000).

The ski mountain has a direct effect on the economics of businesses in Red Lodge, Montana. Anticipated recreation use at Red Lodge Ski Mountain will not differ by alternative and decade. The facility provided over 100,000 ski days during the 1983-1984 ski season. The operating costs of the site are considered a function of private ownership, but the fees collected by the Forest are calculated into the PNV of each alternative. However, the income from this special use permit has little effect on the Custer National Forest as a whole.

A significant effect of this special use is to public safety. Red Lodge Ski Area is required as part of the permit to have a ski area operation and safety plan. There are regular inspections of all facilities by Forest Service officials. Some environmental consequences occurred during the construction of the ski area and some continue during the site's maintenance. These includes converting a timbered slope to a grass/tree mixture and maintaining this condition for ski runs, neither of which is

considered significant. The design of the existing runs dominates the characteristic landscape.

This site is considered to be open and available in all alternatives, except Alternative 8, which has limited special use administration die to the constrained budget.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The roads and ski slopes have had a severe impact on the visual resource and will be long-lasting. The vegetation and soil conditions that existed prior to construction are lost. Vegetation on ski slopes is converted from a lodgepole pine timber type to a grass type. These long-term losses have occurred to provide a continuing popular recreation opportunity for Forest users.

Irreversible and Irretrievable Commitment of Resources

The Red Lodge Ski Area will likely be maintained into the foreseeable future, although it is possible to terminate the permit with reasonable cause. It is an irreversible commitment of resources since the roads, ski slopes, and facilities are essentially permanent features of the landscape.

Adverse Effects Which Cannot be Avoided

In order for the ski area to function and provide a safe environment, new tree growth on the ski runs and under lifts are routinely removed. As with any major activity involving the public and winter sports, there is always a risk of personal accidents and mechanical breakdown.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

None identified.

Energy Requirements

The Forest Service will use energy in monitoring the ski area's operating and safety plan. Weekly inspection of the facilities are conducted during the operating season. This is considered to be a minor portion of the Forest's total energy consumption.

b. Other Recreation Uses

Recreation special uses are all non-Forest Service activities on the Forest which are recreation oriented. They include commercial and non-commercial uses and are administered under a permit. These types of permits include organizational camps, summer homes, target ranges, and outfitter and guide camps. There are about 120 residential and organization site permits on the Custer National Forest.

The effects of the permanent structures (homes and camp buildings) are primarily the same as for developed recreation sites. There is vegetation loss, visual impacts and wildlife displacement for the duration of the permit. At such time that a permit is not reissued, structures will be removed and the site restored to near original condition, although some productivity may be irretrievably lost.

Outfitter and guide permits usually designate use on specific campsites within the Forest. A limited number of service days are allowed. See the Forest Management Plan for the guidelines of outfitter and guide permit issuance. Outfitter and guide permits cover all commercial outfitting operations involving services for accommodating and transporting guests, and providing equipment, supplies, and materials. Pack, hunting, and float trips are examples. The use most generally occurs in the Absaroka-Beartooth Wilderness and the areas leading to it. The policy governing these uses in the Wilderness is coordinated with the Greater Yellowstone Outfitter and Guide Policy which strives to minimize adverse impacts to a wilderness. See the Forest Management Plan for the details. Day guides and hunting guides are increasing in other parts of the Forest.

The primary effects of outfitting and guiding are essentially the same as for dispersed recreation except that individual campsites are established and the outfitters and guides are a commercial concern.

The amount of use at these special use recreation sites or services were projected simultaneously with other developed and dispersed recreation activities. See Tables IV-4 and IV-6. The actual increase or decrease in the number of recreation special use permits was hot projected in the alternatives.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The organizational camps and summer homes are considered a long-term commitment. Production of nonrecreation values such as forage, timber or wildlife habitat at these sites are foregone. There will be a small amount of degradation at outfitter and guide campsites as a result of trampled vegetation, soil compaction and fire rings. The use of a campsite is short-term each year and properly-used sites normally recover. The Forest Service benefits from the cooperative agreements associated with the special use permits by acknowledging permittee efforts in trail maintenance, cleanup, revegetation, and similar rehabilitative and preventive work. This service also allows more people to enjoy the Forest lands who may not otherwise visit.

Irreversible and Irretrievable Commitment to the Resource

The permits for organizational camps and summer homes are periodically and regularly reviewed. It is conceivable that a permit could be revoked (not reissued) if there are justifying reasons. Outfitter and guide permits are usually

made for one year at a time so there is no irreversible or irretrievable commitment to the resource.

Adverse Effects Which Cannot be Avoided

By allowing fairly exclusive use of organizational camp and summer homes, a sizeable portion of the public is not allowed use or access to the camp or summer home area. Outfitters and guides are providing services to the public and there is always a risk to public safety.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

As summer home permits are reviewed, a conflict can be discovered between the residence and other land use needs. An example could be a summer home in grizzly bear habitat. Use of organizational camps may create a conflict with Forest management if campers abuse the surrounding environment (i.e. cutting teepee poles, digging up plants). The Greater Yellowstone Outfitter and Guide Policy is followed in the Absaroka-Beartooth Wilderness and adverse impacts to the wilderness resources are minimized. Other outfitter and guide permits are analyzed so that particularly sensitive areas, such as riparian areas, lake shores and streambanks are not over-utilized. A conflict can develop if outfitter and guide businesses compete for a limited number of permits or for specific use areas. Forest Management Plan direction sets guidelines to avoid or minimize this conflict.

Energy Requirement

Some energy will be used by the Forest in monitoring these special uses, but is a minor portion of the Forest's total energy consumption.

6. Community

Community special uses provide services, facilities, or housing for persons living in urban or rural areas where a dependency on National Forest lands exists. Except for residences, the permits are generally issued to a public agency or a nonprofit organization. These uses on the Forest include schools and government-owned buildings. Community special uses are not projected in the alternatives.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The effects of permanent community structures construction are the same as discussed in Section D, Buildings and Facilities of this chapter. Vegetation productivity will not exist during the life of the facilities.

Irreversible and Irretrievable Commitment of Resources

These buildings will likely be maintained into the foreseeable future. The commitment of this use is irreversible. The vegetation loss represents an irretrievable commitment.

Adverse Effects Which Cannot be Avoided

The presence of the buildings does affect natural landscape, although many facilities have become accepted as historic features. Adverse effects of soil disturbance will remain long after the facility is gone.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

None identified.

Energy Requirements

The energy required to heat and light the buildings is the responsibility of the permittee. Some energy will be used by the Forest to inspect the buildings once a year, but is a minot portion of the total Forest energy consumption.

7. Research and Study

This category includes permits for the reconnaissance, examination and excavation of cultural resources, research at weather stations, and land management demonstration areas. Permits are issued for the advancement of science or to insure consideration and protection of cultural resources in connection with project proposals. Activities include both earth disturbing and nondisturbing examinations.

These permits will not vary by alternative and the consequences are estimated to be very minor, except for the activities associated with cultural resource study. The effects of surface-disturbing examinations on other resources are discussed in Section G, Cultural Resources, of this chapter.

8. Electronic and Microwave Sites

Electronic sites are usually located in high points of land because of elevation or other factors that make it suitable for installation and operation of radio transmitting and receiving equipment. These sites may be used by other Federal agencies or other commercial operations under a special use permit. The environmental consequences of these activities are considered insignificant. However, specific sites will be analyzed for suitability prior to permit issuance. Some sites, such as on the Beartooth Ranger District (Montana) have already been studied, permits issued and are in use.

9. Hydroelectric Dams

The Forest has one hydroelectric dam with associated facilities at Mystic Lake on the Beartooth Ranger District. The environmental consequences of a hydroelectric dam would be disclosed through a site-specific analysis.

Q. Rights-of-Way

Road and trail right-of-way easements are acquired by the Custer National Forest from private or other landowners, generally in connection

with the Forest's timber and minerals (oil and gas) program and access needs. The average number of right-of-way cases processed has been two to three per year for the last ten years. No projection was made for needed right-of-way easements in the alternatives. However, the need for easement is commensurate with the level of road construction. See Section W, Road System, in this chapter for discussion.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Right-of-way easements give the Forest an opportunity to manage lands which might otherwise be unavailable. As a result of having a right-of-way, the productivity of the accessed land can be maintained or improved.

Irreversible and Irretrievable Commitment of Resources

Right-of-way easements can be cancelled, although this is unlikely to happen in the foreseeable future. A right-of-way road implies an irreversible use, and the vegetation removed by the road or trail construction and maintenance constitutes an irretrievable loss.

Adverse Effects Which Cannot be Avoided

Adverse effects of the resulting roads are discussed in Section W of this chapter.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

Access to and within the Forest does not conflict with other plans in the area. Conflicts regarding the road system are found in Section W Road System, of this chapter.

Energy Requirements

The energy used in obtaining easements involves identifying and surveying appropriate routes and negotiating an easement agreement with the landowner.

R. Property Boundary Location

About 40 miles of Forest boundary are surveyed annually, commensurate with the current level of resource management. The amount of boundary location accomplished may vary from one year to the next. This activity involves considerable manpower and time, but has few environmental effects. Some vegetation may be trimmed or completely removed to establish lines-of-sight for survey instruments, but the area affected is very small.

Boundary locations establish, with some finality, the property lines of National Forest System lands and other ownerships. It enables the Forest Service and other owners to avoid trespass activities. The location of boundary lines has no effect on the economy of the area.

Alternative that require intensive resource program, such as 2, 3, 7, and 7a would also require greater boundary survey. However, any expected mileage accomplishment was not projected in any of the alternatives.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Location of boundary lines has no effect on productivity other than it delineates the sites on which management activities by the different owners might occur.

Irreversible and Irretrievable Commitment of Resources

There is no commitment of resources associated strictly with boundary location. The commitment occurs on one or both sides of the line when specific actions are initiated.

Adverse Effects Which Cannot be Avoided

Some vegetation may be removed or pruned along survey lines, but the effects should be short-lived.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

Some conflict may occur if existing and established land uses are found to be in trespass, ether on private or Federal lands.

Energy Requirements

Some energy is expended in travel when surveying but this is small compared to total Forest energy use.

S. Land Ownership Adjustment

Land exchange proposals are generally initiated by private owners. Exchange proposals for the future are unknown, and there are no differences in how they will be handled among alternatives. Three or four proposals are received each year and two or three proposals are acted on each year. Other land exchange proposals under consideration would exchange state and private land within the Forest for Bureau of Land Management (BLM) land outside the Forest. Land ownership adjustments are generally done to improve management efficiency and are within the direction of the Northern Regional Guide.

Proposals are being considered for transferring approximately 3,800 acres of National Forest System land in the south east corner of the Pryor Mountains to the BLM. This would result in that agency administering the entire Pryor Mountain wild horse range except for the portion on the Yellowtail National Recreation Area administered by the National Park Service. The east boundaries of the proposed Lost Water Canyon Research Natural Area and of the proposed wilderness area would become the west boundary of the wild horse range.

No lands ownership adjustments projections are made in the alternatives. Each proposal requires a separate and site-specific analysis.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Lands which enter private or other agency ownership following exchange will be managed as the new owner desires or as mandated by law. Lands obtained by the Forest Service through exchange will be managed under the laws, regulation and policies of the Forest Service. Land exchanges usually provide more manageable blocks of National Forest System lands, increasing administrative efficiency and land management coordination.

Irreversible and Irretrievable Commitment of Resources

Lands entering private or other agency ownership through exchange are committed to whatever the new owner desires or as mandated by law. Lands obtained by the Forest Service may or may not be committed to particular uses according to the land management plan in effect at the time. The exchange is not likely to be reversible. There are no irretrievable commitments of resources at that time.

Adverse Effects Which Cannot be Avoided

The exchange proposal, upon further analysis, would indicate any specific adverse effect. Generally speaking, a land exchange must benefit the government before the action is completed.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

None identified.

Energy Requirement

Little energy is used in land exchange, except than to develop appraisal reports, based on field examinations. This is considered very minor.

T. Timber Production

Timber is produced from the timbered lands designated as "suitable Forest lands". See Glossary for definition. The Custer National Forest contains 156,731 acres available and suitable for timber management. The extent of the environmental consequences of timber harvest is dependent upon the management regimes selected. Primary timber production activities are: (1) silvicultural prescriptions for timber stand management, and (2) logging systems implemented to remove harvested trees. A discussion of the general environmental consequences of the activities follows.

Timber production occurs on the three National Forest Ranger Districts (Beartooth, Ashland, and Sioux in Montana and South Dakota) of the Forest and provides supplies for local lumber mills and posts and poles and firewood for the local public. Timber harvest helps to maintain vegetative diversity by removing dead and dying timber and by creating openings and forage for wildlife and domestic grazing. The level of timber production by alternative and decade is displayed in Table IV-13. (Decade 1 is the planned output level; the following decades are projected.)

In the long-term, Alternatives 3, 7, and 7a have the larger timber programs. Because of the larger programs, more acres are harvested over time and there is a greater opportunity to provide vegetative diversity. Alternative 8 (Current Management) has the smallest timber production program due to the markedly constrained budget.

Recreation opportunities and visual conditions can be affected by timber harvest. The addition of roads and alterations to the landscape can change the recreation opportunity from primitive and non-motorized to semi-primitive or roaded natural. Scenery can be negatively affected by improper changes to existing landscapes. However, the Visual Quality Objectives for Custer ensure that the natural-appearing landscape will remain dominant to manmade changes over the vast majority of the land. See the Visual Resource direction in the Forest Management Plan for details.

Threatened or endangered animal species that may inhabit the wilderness areas, such as the grizzly bear, peregrine falcon, and black-footed ferret, would be afforded protection, but there would be limited opportunity to actively manage the habitats. Other threatened and endangered species possibly found on the Custer National Forest, the interior least tern, piping plover and bald eagle, would most likely not be affected by a wilderness designation due to their association with river bottoms and large bodies of water which do not occur in the potential wilderness areas. There are not any Federally listed threatened or endangered plant species on the Custer National Forest, however, the plants included in state lists and in a Category 2 status of the Federal list would be afforded some degree of protection with a wilderness classification.

The effect of timber production on employment, as shown in Table IV-14, were calculated by IMPLAN, a computer program which uses U.S. Census Bureau economic statistics for the Forest's zone of influence (see Appendix B, Section V, Social and Economic Impact Analysis, for details). The model predicts changes in private sector income due to changes in production levels. Direct effect dO loggers and millworkers, indirect effects to suppliers of goods and services to the timber industry and induced effects to providers of common retail goods and services to the above two groups were calculated to determine the total income effects associated with the

TABLE IV-13

TIMBER HARVEST BY ALTERNATIVE

	Alternative/Benchmark																PA	MAX	MIN
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10	PNV	LVL
Allowable Sale Quantity	MMBF			1980 = 1.5															
Decade 1	3.5	2.2	4.4	3.4	4.1	6.7	6.7	6.7	4.0	8.4	6.7	6.0	6.0	6.0	4.0	3.1	3.0	0	0
Decade 3	3.5	6.6	9.1	7.1	7.1	6.8	7.0	7.0	4.0	8.4	7.2	8.7	7.1	6.3	3.2	8.0	3.0	17.3	0
Decade 5	3.5	8.8	9.2	7.6	7.0	6.8	7.0	7.0	4.0	8.4	7.2	11.2	9.6	10.0	3.2	6.5	3.0	15.9	0
Decade 7	2.6	8.0	6.0	5.0	7.0	6.8	7.0	7.0	4.0	8.4	7.2	7.4	6.3	6.6	3.2	4.1	3.0	5.5	0
Allowable Sale Quantity	MMCF			1980 = .33															
Decade 1	1.0	0.6	1.3	1.0	1.2	1.9	1.9	1.9	1.1	2.4	1.9	1.7	1.7	1.7	1.1	0.9	0.9	0	0
Decade 3	1.0	1.9	2.6	2.0	2.0	1.9	2.0	2.0	1.1	2.4	2.1	2.5	2.0	1.8	0.9	2.3	0.9	4.9	0
Decade 5	1.0	2.5	2.6	2.2	2.0	1.9	2.0	2.0	1.1	2.4	2.1	3.2	2.7	2.9	0.9	1.8	0.9	4.5	0
Decade 7	0.8	2.3	1.7	1.4	2.0	1.9	2.0	2.0	1.1	2.4	2.1	2.1	1.8	1.9	0.9	1.2	0.9	1.6	0

TABLE IV-14

TIMBER HARVEST — RELATED EMPLOYMENT BY ALTERNATIVE
(manyears employment per year)

	Alternative/Benchmark																PA	MAX	MIN
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	10	PNV	LVL
Decade 1	16.1	10.0	20.2	15.6	18.9	30.8	30.8	30.8	18.4	38.6	30.8	27.6	27.6	27.6	18.4	14.3	13.8	0.0	0.0
Decade 3	16.4	30.4	41.9	32.7	32.7	31.3	32.2	32.2	18.4	38.6	33.1	40.0	32.7	29.0	14.7	36.8	13.8	79.6	0.0
Decade 5	16.1	40.5	42.3	35.0	32.2	31.3	32.2	32.2	18.4	38.6	33.1	51.5	44.2	46.0	14.7	29.9	13.8	73.1	0.0
Decade 7	16.1	36.8	27.6	23.0	32.2	31.3	32.2	32.2	18.4	38.6	33.1	34.0	29.0	30.4	14.7	18.9	13.8	25.3	0.0

timber production in each alternative.

The 1980 Resources Planning Act Policy Statement in the Forest Service Manual 1920, October 1982, R-1 Supplement 5, requires a comparison of long-term sustained yield (LTSY) for timber with the projected growth rate of timber at year 2035, for the Preferred Alternative, Alternative 10. Based on this policy statement, and referenced as the President's Policy, the rate of tree growth (cubic feet/acre/year) at year 2035 needs to be 90 percent or more of the growth rate at LTSY. Table IV-15 displays the LTSY, growth and growth as percent of LTSY in 50 years (1985-2035) for all alternatives.

TABLE IV-15

GROWTH AS PERCENT OF LONG TERM SUSTAINED YIELD

ALTERNATIVE	LTSY (MMCF)	GROWTH (MMCF)	GROWTH AS % OF LTSY
1	1.9	1.2	71
2	2.5	1.6	64
3	3.0	2.0	67
4	1.8	1.1	61
5	2.3	1.6	70
5a	2.0	1.6	80
5b	2.5	1.6	64
5c	2.6	1.6	62
6	1.9	1.6	84
6a	3.1	2.4	77
6b	2.6	1.8	69
7	3.3	2.2	67
7a	2.9	2.0	69
7b	2.6	2.0	77
8	0.7	0.5	71
9	2.1	1.4	67
10	1.8	1.4	72
MAX PNV	2.7	1.4	52
MIN LVL	0.0	0.0	00

Alternatives 5a, 6 and 7b come the closest to meeting the 90 percent standard. The preferred alternative, Alternative 10, lies close behind at 72 percent.

The 90 percent is not reached because timber harvest is not large enough in the early periods to remove old growth timber. Neither is it high enough to bring the Forest into a regulated condition that meets the President's direction. The timber benchmark analyzed the President's direction and it was obvious that a large investment was necessary in the immediate future to meet the target. See Appendix B, Section C, Benchmarks, and Table B-10, under Total Costs. Most alternatives have modest timber production program compared to the potential.

1. Silvicultural Methods

a. Even-aged Systems for Timber Production

Even-aged systems of timber management produce stands of timber composed of one or two structural components. The trees within each component are relatively the same age. Three major silvicultural methods are used to create and manage for even-aged stands: clearcutting, shelterwood and seedtree. In clearcutting, all trees are removed from the area in a single cut for the purpose of creating a new even-aged stand. In shelterwood cutting, a portion of the mature trees are removed leaving a partial forest canopy to shelter regeneration. A subsequent final harvest removes these remaining mature trees when the regeneration reaches an appropriate size and shelter is no longer needed, usually 10 to 20 years

later. Seedtree system, seldom used on the Custer, harvests nearly all mature trees in any particular stand at the first entry. Some of the better mature tpees are left standing to provide seeds for regeneration. If feasible, these remaining trees will be harvested after seedlings are established. Clearcutting and shelterwood systems are the most common methods of even-aged timber production on the Custer.

1) Lodgepole Cover Type

Clearcutting is used extensively in lodgepole pine stands. Lodgepole pine is extremely intolerant to shade, and seed germination and root development is inhibited in shaded situations. Therefore, when regeneration to lodgepole is desired, clearcutting or at least, a very open stand condition, must be provided for seed germination and maximum growth.

Shelterwood is rarely appropriate for lodgepole pine on the Custer National Forest. If it is used to perpetuate another resource value(s), less growth can be expected due to shading of regeneration.

2) Ponderosa Pine and Douglas-fir Cover Types

Shelterwood systems tend to be more successful on the ponderosa pine and Douglas-fir types on the Custer National Forest. Because these sites are dry and these species are shade tolerant, leaving some overstory canopy insures successful regeneration. This shelter protects the soil from excessive moisture depletion and the seedlings from heat damage. At some sites, sufficient healthly shelter trees may not be available due to heavy infestations of dwarf-mistletoe, spruce budworm or undesireable genetics. In these cases, clearcutting may be used with subsequent artificial regeneration to create a superior new stand of healthy trees.

Clearcutting can be used on the moister sites for both species because soil moisture is important to regeneration. On these sites, shelter trees are not needed to protect regeneration. Natural generation is usually successful, providing there is adequate seed source and site preparation.

Even-aged systems have the potential for adverse environmental effects because all large trees are removed from the area in a short period of time. Openings are thus created and more soil is exposed to erosion (Bethlahmy, 1967; Megahan and Kidd, 1972). Appropriate silvicultural systems will be determined by habitat type and management area goals, and approved by a certified silviculturist. Below-cost timber sales may occur periodically due to access costs (road construction, rights-of-ways, rehabilitation and watershed costs) being borne by the first sale in an area even though the road will serve many uses and provide access for timber production over a long period of time. The average acreage to be cut each year by these methods is shown in Table IV-16. (Decade 1 values are planned; other decade values are projected.)

Alternative 7 is designed to emphasize commodity outputs and the acreage of timber production by even-aged management remains higher longer than for the other alternatives.

With any silvicultural prescription that removes trees, evapo-transpiration is reduced and more water is infiltrated into the groundwater system. This is emphasized when even-aged systems are used, because usually the entire mature forest canopy is removed. In extreme cases, complete removal can lead to pass soil failure on steep slopes and clay soils (Dryness, 1967; Fredrickson, 1970; Megahan, 1971), although mass failure hazards are generally low on the Custer National Forest. Site-specific analysis would pinpoint any potential problems.

Because opening is forest canopy tend to accumulate snow, water yield is generally increased following harvest. This is usually apparent at the time of peak flow, late spring or early summer. The water regime for an area harvested by an even-aged management system will generally recover to pre-harvest conditions about 20 years after harvest (Garn and Malmgren, 1973). The increased water flow can benefit irrigation needs, providing storage capacity (dams) exists to capture the increased flow. Increasing the flow at peak times also can adversely affect the stability of the stream banks and result in some erosion.

Due to dry, near arid conditions of most the Custer, there will be little expected sedimentation or debris entering streams as a result of timber pro-

TABLE IV-16

EVEN-AGED HARVEST ACRES BY ALTERNATIVE
(average acres per year)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Even-Aged Harvest Acres																			
Decade 1	374	206	523	306	499	751	751	751	397	755	332	545	665	587	389	388	340	000	000
Decade 3	136	000	421	578	290	103	332	365	129	601	508	405	428	246	163	720	149	1316	000
Decade 5	269	1122	1198	914	1012	984	1016	1016	406	883	670	1142	902	961	326	594	268	2266	000
Decade 7	55	696	656	664	284	825	768	735	93	1072	541	843	708	927	245	476	169	915	000

duction (See Chapter III, Section A, Physical, Biological, Social and Economic Setting, for more details). Timber is not harvested in areas of heavy snowpack where spring run-off may be a concern. Riparian areas on the Custer National Forest are not suitable for timber production.

Even-aged systems provide the best opportunity for reduction of fuel hazards. In clearcuts, there are no residual trees to be protected from fuel elimination methods, i.e., broadcast burning or dozer piling and burning. These methods when used in a shelterwood system are more difficult and costly because the residual trees must be protected.

Forage production is greater and lasts longer on clearcut areas than on shelterwood areas, where this transitory range remains for a shorter period of time because trees occupy more of the site. Livestock and big game use this forage and competition for forage could develop on some big game winter range areas.

Even-aged systems tend to reduce big-game cover, but likewise increases vegetative diversity for other wildlife needs as openings are created in dense canopies. Wildlife species which prefer openings or sparse canopies will find more suitable habitat, and those species preferring dense canopy or old-growth trees will find less.

Of public concern is the amount of old growth timber that will be maintained on the Forest. There are 300,428 acres of non-wilderness lands not available for timber management because they produce less than 20 cubic feet of growth per acre per year. Old growth is expected to develop and remain in these areas unmanaged for timber, as well as in the productive timber lands of the Absaroka-Beartooth Wilderness and Lost Water Canyon, recommended wilderness area of the Beartooth Ranger District (Montana). Table IV-17 shows the percentage of the tentatively suitable timber base estimated to be in old growth in 75 years (for actual acreages, see Figure II-9, in Chapter II).

Even-aged systems provide the best opportunity for control of insects and disease because all diseased or susceptible trees are removed and a young, vigorous stand is initiated. Clearcutting may be the only system which provides this control if all trees are unhealthy. In some cases, where shade is necessary for seedling survival, a shelterwood cut is appropriate provided the remaining overstory is removed after seedlings have become established and before the young trees can be infected.

Timber productivity in the future is enhanced by application of the proper silvicultural system. Old, slow growing trees are replaced by young, faster growing trees, and that growth rate can be sustained by thinning, weeding, and other intermediate cutting.

Clearcutting is the least costly method of harvesting trees because greater volumes of wood fiber are removed than from shelterwood systems on the same size area. Shelterwood is slightly more costly because the required second harvest of the remaining overstory. Costs vary by species harvested, land slope, yarding distance, and other factors, but the removal of all trees from a site is cheaper per unit volume than removal of only a portion of the overstory.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

From a timber production standpoint, even-aged systems provide the best chance to improve the long-term productivity. To a large extent, insects and diseases are controlled; young and vigorously-growing trees replace slow growing old trees; fire hazards are reduced; and the proper mix of tree species can be introduced. Some soil is lost and peak flows of water are increased. Habitat for wildlife species which prefer closed canopies is reduced, but habitat for those species preferring openings is increased. Trees can be left to die in even-aged management systems to create habitat for cavity nesters.

Irreversible and Irretrievable Commitment of Resources

Areas which have been harvested by even-aged systems are usually committed to timber management in the future. Even-aged management can benefit other forest resources and the resulting new stand of trees does not necessarily have to harvested for the maximum silvicultural gain. The commitment of harvested areas to timber management is reversible. The investment in roads and regeneration is irretrievable and the roads will also create an irretrievable loss of roadless resource.

With recent concern over below-cost sales, the timber program on the Custer (which requires significant costs) may not be perpetuated and previously harvested areas may in fact be managed for livestock grazing or wildlife habitat. The

TABLE IV-17

PERCENT OF SUITABLE LAND EXPECTED TO BE IN OLD GROWTH IN 75 YEARS

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Percent	47	35	22	53	40	47	36	33	51	18	33	15	26	32	80	46	54	45	0

wildlife habitat and the landscape changed by harvest are irretrievable.

Adverse Effects Which Cannot be Avoided

Visual quality will be altered by even-aged systems. VQO's ensure that the change will be acceptable, but possibly obvious. Some soil will be eroded and water quality may be temporarily lowered. Wildlife habitat will decrease for species preferring dense canopies for a period of time. Some non-motorized recreation opportunities will be lost.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

Some wildlife habitat, as discussed previously, may be altered and a conflict could arise if timber management goals and wildlife management goals are not closely coordinated. The Forest Management Plan has sought a balance between these two resource through coordination with state agencies.

A similar conflict could arise between timber and roadless area management, although this issue on the forested lands of the Custer is not as sensitive as on other National Forests.

Energy Requirements

Since most of the timber on the Forest will be harvested by even-aged systems, most of the energy required will be directly associated with these systems. Table IV-18 displays the energy requirements for timber production and associated activities.

b. Uneven-aged Systems for Timber Production

Uneven-aged systems of timber harvest produces stands of timber which contain a variety of age classes from mature trees to seedlings. There are two major harvest methods to accomplish this: selection and group selection.

Selection harvest removes individual trees from a stand. Harvested trees are usually mature, overmature or undesirable. Younger trees are retained to continue growth until reaching maturity. The objective is to create a multi-storied stand of different age classes.

Group selection removes small groups of trees, usually 1/4 to 5 acres in size from a stand. The objective of this method is to create a mosaic of age classes across the stand over time.

1) Lodgepole Pine Type

Because lodgepole pine is intolerant to shady conditions, regeneration is limited with this system. However, if site conversion is desired for transitory range or greater edge effect, group selection can be used fairly successfully. Eventually the site will return to timber cover.

2) Ponderosa Pine and Douglas-fir Types

Selection and group selection may be used in these cover types where continuous tree occupancy is necessary, primarily for the protection or enhancement of non-timber resources. This method will not optimize timber growth. On some drier sites where excessive moisture depletion could be a problem for regeneration, either a shelterwood or seed tree system would be preferable to encourage timber production. Uneven-aged management is used primarily on the Custer National Forest to preserve big game habitat or to

TABLE IV-18

HARVEST ACTIVITIES ENERGY CONSUMPTION

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Timber Felling (thousands of gallons of gasoline)																			
Decade 1	0.4	0.2	0.4	0.3	0.4	0.7	0.7	0.7	0.4	0.8	0.7	0.6	0.6	0.6	0.4	0.3	0.3	0.0	0.0
Decade 3	0.4	0.7	0.9	0.7	0.7	0.7	0.7	0.7	0.4	0.8	0.7	0.9	0.7	0.6	0.3	0.8	0.3	1.7	0.0
Decade 5	0.4	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.4	0.8	0.7	1.1	1.0	1.0	0.3	0.7	0.3	1.6	0.0
Decade 7	0.3	0.8	0.6	0.5	0.7	0.7	0.7	0.7	0.4	0.8	0.7	0.7	0.6	0.7	0.3	0.4	0.3	0.6	0.0
Timber Yarding (thousands of gallons of diesel)																			
Decade 1	5.3	3.3	6.6	5.1	6.2	10.1	10.1	10.1	6.0	12.6	10.1	9.0	9.0	9.0	6.0	4.7	4.5	0.0	0.0
Decade 3	5.3	9.9	13.7	10.7	10.7	10.2	10.5	10.5	6.0	12.6	10.8	13.1	10.7	9.5	4.8	12.0	4.5	26.0	0.0
Decade 5	5.3	13.2	13.8	11.4	10.5	10.2	10.5	10.5	6.0	12.6	10.8	16.8	14.4	15.0	4.8	9.8	4.5	23.9	0.0
Decade 7	5.3	12.0	9.0	7.5	10.5	10.2	10.5	10.5	6.0	12.6	10.8	11.1	9.5	9.9	4.8	6.2	4.5	8.3	0.0
Timber Loading (thousands of gallons of diesel)																			
Decade 1	5.3	3.3	6.6	5.1	6.2	10.1	10.1	10.1	6.0	12.6	10.1	9.0	9.0	9.0	6.0	4.7	4.5	0.0	0.0
Decade 3	5.3	9.9	13.7	10.7	10.7	10.2	10.5	10.5	6.0	12.6	10.8	13.1	10.7	9.5	4.8	12.0	4.5	26.0	0.0
Decade 5	5.3	13.2	13.8	11.4	10.5	10.2	10.5	10.5	6.0	12.6	10.8	16.8	14.4	15.0	4.8	9.8	4.5	23.9	0.0
Decade 7	5.3	12.0	9.0	7.5	10.5	10.2	10.5	10.5	6.0	12.6	10.8	11.1	9.5	9.9	4.8	6.2	4.5	8.3	0.0
Timber Hauling (thousands of gallons of diesel)																			
Decade 1	22.4	14.1	28.2	21.8	26.2	42.9	42.9	42.9	25.6	53.8	42.9	38.4	38.4	38.4	25.6	19.8	19.2	0.0	0.0
Decade 3	22.4	42.2	58.2	45.4	45.4	43.5	44.8	44.8	25.6	53.8	46.1	55.7	45.4	40.3	20.5	51.2	19.2	110.7	0.0
Decade 5	22.4	56.3	58.9	48.6	44.8	43.5	44.8	44.8	25.6	53.8	46.1	71.7	61.4	64.0	20.5	41.6	19.2	35.2	0.0
Decade 7	16.6	51.2	38.4	32.0	44.8	43.5	44.8	44.8	25.6	53.8	46.1	47.4	40.3	42.2	20.5	26.2	19.2	35.2	0.0
Total Energy needs (thousands of gallons of gasoline and diesel)																			
Decade 1	33.4	20.9	41.8	32.3	39.0	63.8	63.8	63.8	38.0	79.8	63.8	57.0	57.0	57.0	38.0	29.5	28.5	0.0	0.0
Decade 3	33.4	62.7	86.5	67.5	67.5	65.5	66.5	66.5	38.0	79.8	68.4	82.8	67.5	59.9	30.4	76.0	28.5	164.4	0.0
Decade 5	33.4	83.6	87.4	72.2	66.5	64.6	66.5	66.5	38.0	79.8	68.4	106.4	91.2	95.0	30.4	61.9	28.5	84.6	0.0
Decade 7	27.5	76.0	57.0	47.5	66.5	64.6	66.5	66.5	38.0	79.8	68.4	70.3	59.9	61.8	30.4	39.0	28.5	52.4	0.0

stimulate deciduous sprouting, such as aspen.

These uneven-aged systems have less effect on the visual resource than even-aged systems and do not generally adversely affect wildlife values. Water quality and quantity are not measurably affected by this system because the canopy is not altered significantly, the soils are not unduly disturbed, and the remaining trees are able to utilize the extra water (Rice and Others, 1972).

As more and more of the Forest becomes regulated, the acreage of selection or group selection increases and diversity is accomplished. Table IV-19 shows the acres to be harvested by selection and group selection by alternative.

Alternatives 2 (RPA), 3, 4, 6, 6a, 7, and 7a harvests the most acres by selection (or group) harvest systems. These alternatives share a common constraint of an identified minimum level of harvest. Alternative 8 (Current Management) cuts the least acres by selection harvest systems because of limited budgets.

Fire and slash are more difficult to manage in selection harvest systems. There is little opportunity to reduce fuel loads. Generally, openings created are not large enough to allow burning of slash without damage to residual vegetation. Handpiling and winter burning can be done in certain areas and slash can be reduced by requiring that whole trees (untrimmed) be pulled in a yarding area and be trimmed there. The new age class created by uneven-aged management can, over the long-term, stem catastrophic fires or insect/disease infestations.

Little additional forage is produced by selection harvest except in some group selection units. These small openings (usually less than a 100 feet in diameter) can provide good habitat for those species of wildlife that prefer to feed in openings but need trees for nesting and breeding. The forage produced in these small openings tends to disappear as tha canopies of the remaining trees expand. Selection harvest generally has little effect on the cover requirements for big game, but does provide edges and additional browse and grass.

Some old-growth characteristics of a stand are retained at the expense of timber volume by a selection harvest system. Some older trees can be left to eventually die, creating habitat for cavity nesters. A certain timber volume is lost by doing this. In most cases, the older trees, at least those in excess of needed snags, can be removed by a selection harvest system. Selection harvest often involves more entries into a timber stand than even-aged systems and may result in increased sediment and possible detrimental impacts to fish and wildlife (Smith, 1962).

It is more difficult to control insects and diseases with selection harvest than with even-aged harvest systems. If the infestation is not large, some control can be attained by group selection of the infested trees.

The selection system is more costly to apply than even-aged management systems because each tree must be designated for cutting. Logging costs are higher because less volume per acre is removed and care must be taken to protect the residual stand.

Recreation opportunities are changed very little by selection harvest systems except for the additional roading. During the harvesting operation and for a short time thereafter, the noise and debris may disturb some recreationists, but the evidence of the disturbance declines rapidly following completion of slash disposal. Roadless areas will be lost by the intrusion of the necessary roads.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Timber harvest by the selection system has little effect on the natural long-term timber productivity of the site. There is little opportunity to enhance production by introduction of other tree species or by cultural practices, such as thinning. However, a long-term benefit of greater vegetative diversity can be achieved with these systems. Compared to even-aged management systems, the habitats of fish and many wildlife species are at least maintained and the opportunity to enhance that habitat exists. Visual quality is maintained.

Irreversible and Irretrievable Commitment of Resources

The choosing of selection harvest for an area does not commit that area to timber harvest in the future, although it is likely these areas will continue to be harvested by this system in the foreseeable future since there is a developed road

TABLE IV-19

UNEVEN-AGED HARVEST ACRES BY ALTERNATIVE

	Alternative/Benchmark																			
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Selection Cut Acres																				
Decade 1	286	237	000	000	1	000	000	000	209	916	1051	438	000	185	188	000	15	000	000
Decade 3	770	2214	1368	429	1249	1513	1321	1394	966	1328	961	1745	1266	1243	499	268	431	558	000
Decade 5	286	000	000	000	000	000	000	000	000	253	410	000	000	000	000	000	000	000	000
Decade 7	714	1576	1047	213	1492	1216	910	1139	1104	1093	1114	1311	1054	868	392	337	602	254	000

system to these areas. The timber that could have been grown by applying a more productive silvicultural system is irretrievable.

Adverse Effects Which Cannot be Avoided

There are few adverse effects associated with selection harvest, although optimal timber production is foregone. If applied drastically, there will be few snags for cavity nesters or for stream enhancement. Recreation can be disrupted for a short time while the timber is being harvested. The roadless recreation experience can be lost.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

None identified.

Energy Requirements

See Table IV-18 for total harvest energy consumption.

c. Slash Control

Slash is the unusable limbs, tops and cull logs, resulting from timber harvest. It must usually be removed from a timber harvest unit before regeneration can take place. The amount of slash is directly proportional to the Forest's harvest level.

The most common method of disposal is to burn the slash on-site, but, in some cases, large amounts are hauled away to be used as firewood. The objective of slash control and fuels management is to reduce fuel loading to acceptable limits for prevention and control of wildfire. Burning also helps prepare sites for regeneration and eliminates barriers to animal movement (Lyon, 1979; Smith, 1962).

Slash may be tractor-piled and burned on gentle slopes, handpiled and burned, or broadcast burned regardless of slope. Burning slash under a remaining overstory can also be an effective method of disposal. If debris is light, lopping and scattering of limbs and tops is also an acceptable method of hazard reduction. Alternatives which generate the highest timber harvest also generate the highest level of slash control.

Slash disposal can cause short-term visual degradation. In broadcast burning units, a majority of the residual vegetation is usually burned and the unit looks scorched and black. Visual degradation usually lasts only until the first growing season because forbs, grasses, and shrubs resprout or seed and grow rapidly after fire. When slash is burned in dozer piles, scars are left, readily visible on-site. Burned handpiles are virtually unnoticeable to the casual observer after a short period of time. Hot underburns can cause scorch marks on trunks of the remaining overstory and can kill lower foliage. These visual effects will last until the needles fall, and the scorched foliage and bark are replaced.

Air quality will be temporarily degraded by slash burning. Suitable burning conditions occur for only a short time in the spring and fall. Fire weather conditions will be carefully monitored and burning allowed when smoke will be rapidly dispersed.

Tractor piling activity has a high potential for degrading the soil resource (Klock, 1975). If care is not taken, topsoil, litter, and duff can be pushed into the piles. Excessive mineral soil is then exposed to erosion between the windrows. Additionally windrows will not burn as well because the soil smothers the fire. If windrows and the soil beneath them are too dry when burned, the topsoil may be baked, become sterile, and impervious to wetting (Dryness, 1976). The soil structure may be severely altered.

Handpiling and burning has no noticeable effect on the soil. Small areas under the piles may be scorched, but handpiles are usually small and burn cool enough to cause little damage. Bennett (1962) describes methods of controlling burn intensities to reduce risk of soil degradation and erosion. Soil losses caused by burning can be no greater than natural rates if fires are properly managed (Glassy, 1982; USDA Forest Service, 1978).

Firelines around broadcast burn units may be a source of sediment if proper erosion control measures are not taken. Because mineral soil must be exposed so fire will not creep over the line, the soil surface is exposed to raindrop splash erosion and overland flow is likely.

Water quantity is affected more by removal of trees than by slash disposal. The only measurable effect on water yield would occur where large areas of mineral soil were exposed and overland flow was increased by a decrease in infiltration rate. Water quality would be affected in the same way (DeByle and Packer, 1972). Overland flow could increase sediment delivery to the streams if a sufficient strip of undisturbed vegetation is not present between the burned unit and the stream (Snyder and others, 1975).

Slash disposal has an effect on fisheries or streams if water quality or quantity is affected. The removal of large woody material from streams or streambanks may affect the formation of pools by destroying potential debris necessary for addition to the stream as instream debris decays. Overland flow from burned units may carry high levels of nutrients which will temporarily enrich the water and add to available fish food. The duration and magnitude of the nutrient flush is so short and small that detection of the result is unlikely (Snyder and others, 1975).

Slash disposal only has an effect on big-game cover when hiding cover that remains after logging must be burned during slash disposal. Forage may be temporarily reduced by slash disposal

activities, but the reduced competition from trees, plus the nutrients rapidly released by fire result in a flush of shrub, grass, and forb growth in the subsequent growing season.

A totally clean forest floor lacks cover for a wide variety of small animals, many of which depend on insects for food and debris for cover. The removal of all dead, down, and decaying logs can remove a whole segment of the forest ecosystem, eliminating or moving harmful insects and animals as well as beneficial ones. Sufficient woody material should be left and evenly distributed to provide for this need and other shade and protection for seedlings.

Bark beetles and fungi can build up in slash and spread to living trees. Elimination of slash destroys the habitat for these insects and diseases and controls their spread (Furniss and Carolin, 1977). Dozer piling in a partial cut can result in mechanical damage to residual trees and make them subject to insect or disease attack.

Costs of slash disposal vary by piling method, size of unit, and slope. Handpiling is more expensive than machine piling, small units cost more per acre than larger units, and units on steep slopes are more expensive to treat than those on gentle slopes. Unit cost is independent of alternative, but the higher the timber output, the higher the total slash disposal costs. Slash disposal is a necessary cost to the production of timber and, as such, has an effect on the calculation of PNV. How much slash disposal is required depends on the acres of timber harvested each year. Some slash control will be required on practically harvested every acre. Average number of acres harvested each year by harvest type is shown in Table IV-20.

Slash disposal methods vary by type of silvicultural system used. Alternatives that utilize selection cutting systems will require more handpiling and spot burning. Many of the areas harvested by selection cutting may only need lopping and scattering of logging slash. Alternatives 2 (RPA), 3, 4, 6 6a, 7, and 7a harvest more timber by selection harvest than the other alternatives.

Alternatives that have larger proposed timber sale programs in the long-term, such as Alternatives 3, 7, 7a, and 7b, generate more logging slash. Alternatives with smaller timber sale programs produce proportionately less. The effects of slash disposal are proportional to the acres being harvested and therefore proportional to the size of the timber sale program.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Slash control encourages long-term productivity of the Forest's timberland by removing unneeded debris, allowing sunlight and moisture to reach the ground and preparing an adequate seed or planting bed for regeneration. Productivity is adversely affected if slash is not treated or if slash is treated in a poor manner. There is always a chance of displacing soil when windrowing and erosion can occur. Soil fertility may be lost. Burning at the wrong time of weather or within a season and allowing the fire to burn too hot generally has the same effect. Most other effects of slash control are short-term and have little effect on productivity.

Irreversible and Irretrievable Commitments of Resources

Control of slash on a harvest site does not irreversibly commit this area to slash control in the future. However, the intent of slash control is to enable another generation of trees to be established and to reduce the fire hazard by reducing the fuel load. Considering the time and effort expended in slash control it is likely that the generation of trees will be harvested and the slash created by that harvest will be treated. The soil inevitably lost through erosion or sterilization in slash control efforts is irretrievable.

Adverse Effects Which Cannot Be Avoided

The most obvious adverse effect is the generation of smoke into the atmosphere by slash control. Though this effect is short lived, the more timber harvested, the more smoke. Other adverse effects include the scorched and blackened vistas which

TABLE IV-20
ACRES HARVESTED BY HARVEST METHOD
(acres per year by decade)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Even-Aged Harvest Acres																			
Decade 1	374	206	523	306	499	751	751	751	397	755	332	545	665	587	389	388	340	000	000
Decade 3	136	000	421	578	290	103	332	365	129	601	508	405	428	246	163	720	149	1316	000
Decade 5	269	1122	1198	914	1012	984	1016	1016	406	883	670	1142	902	961	326	594	268	2266	000
Decade 7	55	696	656	664	284	825	768	735	93	1072	541	843	708	927	245	476	169	915	000
Selection Cut Acres																			
Decade 1	286	237	000	000	1	000	000	000	209	916	1051	438	000	185	188	000	15	000	000
Decade 3	770	2214	1368	429	1249	1513	1321	1394	966	1328	961	1745	1266	1243	499	268	431	558	000
Decade 5	286	000	000	000	000	000	000	000	000	253	410	000	000	000	000	000	000	000	000
Decade 7	714	1576	1047	213	1492	1216	910	1139	1104	1093	1114	1311	1054	868	392	337	602	254	000

are short-lived and the inevitable displacement and possible erosion of soils.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

If a large quantity of slash is treated at any one time, the Forest has a chance of exceeding the standards set by the Clean Air Act due to the generation of smoke.

Energy Requirements

Some energy is required in slash control. If machinery is used, the energy required for a particular site can be significant. A small amount of energy is used in torches to light fires. Handpiling or slash requires little energy outside the muscular activity of those persons doing the piling. The entire energy requirement for timber harvest is shown in Table IV-18.

d. Site Preparation

The objective of site preparation is to create micro-sites where hand-planted for naturally regenerated tree seedlings have a good chance for survival. Site preparation requires the removal of competing vegetation and exposure of mineral soils. Seeds and seedlings planted in organic matter and duff rather than in mineral soil will dry out and fail to survive. This activity is primarily used following even-aged harvest. Uneven-aged harvest does not usually require site preparation.

Acres of site preparation on the Forest are directly related to the acres of timber harvested. Site preparation is usually accomplished as a spin-off from logging and slash disposal activities. Dozers used to skid logs and pile slash displace litter and other organic matter, and the result is enough exposed mineral soil to provide planting sites. Cable logging displaces some topsoil and broadcast burning or burning handpiles results in some spots where mineral topsoil is exposed. In units where insufficient mineral soil is exposed or competing vegetation has had time to regenerate, the soil surface must be scarified or the competing vegetation must be killed just before planting. Scarification can be done by dozers or other machines on gentle slopes, but must be done by hand on steeper slopes. No chemical control is proposed for the Custer National Forest. Each site must be analyzed to determine the appropriate method.

Mechanical site preparation has the same effect on the visual resource, soils, water quality and quantity, and fish as slash disposal. See Section c, Slash Control for discussion.

Handscalping of the individual tree planting sites is the least costly method of site preparation, if competing vegetation is not too dense. It can also be the least effective because competing vegetation is not completely removed and seedling failure can be high. Machine scarification, piling, and burning is the most effective method because enough mineral soil is exposed and most competing vegetation is removed, but is also very costly. It is possible to "overscarify" and damage the soil and water resources.

Environmental effects of site preparation vary by the level of timber harvest. The higher the timber output, the greater the potential for environmental degradation because there will be more site preparation. Table IV-21 displays the acres by even-aged harvest. This provides the relative change by alternative and decade to interpret the scale of impact. The first decade is planned harvest. The other decade values are projections.

The impacts of site preparation is directly proportional to the acres harvested by even-aged harvest systems. Uneven-aged or selection harvest systems usually do not require site preparation. Alternatives 2 (RPA), and 7 harvest the most timber by even-aged silvicultural systems and therefore require the most site preparation.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Timber productivity of sites depends in part on how quickly trees are established after harvest. Adequate site preparation is necessary to ensure seedling survival and give them a good start against competition with other vegetation. Care must be taken in site preparation so that the relatively thin topsoils are not removed. These soils are necessary for the maintenance of productivity.

Irreversible and Irretrievable Commitment of Resources

Since considerable money and effort is expended in preparing the site for a new generation of trees, it is likely that the next generation of trees on the site will be harvested. Soils inevitably lost or dis-

TABLE IV-21

EVEN-AGED HARVEST ACRES BY ALTERNATIVE
(average acres per year)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Even-Aged Harvest Acres																			
Decade 1	374	206	523	306	499	751	751	751	397	755	332	545	665	587	389	388	340	000	000
Decade 3	136	000	421	578	290	103	332	365	129	601	508	405	428	246	163	720	149	1316	000
Decade 5	269	1122	1198	914	1012	984	1016	1016	406	883	670	1142	902	961	326	594	268	2266	000
Decade 7	55	696	656	664	284	825	768	735	93	1072	541	843	708	927	245	476	169	915	000

placed by site preparation are irretrievable. If for some reason, seedling failure is high, an irretrievable loss of time, effort, growing season and trees will occur.

Adverse Effects Which Cannot be Avoided

The unsightly appearance of sites that have been prepared for regeneration is unavoidable and will remain until vegetation grows and screens the effect from view. Soils are inevitably eroded or displaced. If burning is used, smoke is generated. The noise and scars of site preparation can effect recreation use, at least, for a short time.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

If burning is used in site preparation, there is a possibility of conflict with the Clean Air Act.

Energy Requirements

Energy requirements for site preparation are very similar to those for slash control. The total energy consumption for timber harvest is shown in Table IV-18.

e. Tree Planting

Tree planting occurs after harvest, slash disposal, and site preparation. The proportion of harvest areas to be planted varies by silvicultural system used and individual site needs. Properly designed harvest units on most of the Forest regenerate naturally and no planting is required. Most of the planting on the Forest will be on the Beartooth Ranger District (Montana). Less than 100 acres per year are planted on this District and the average has been about 20 acres per year. There are only minor, insignificant differences among the alternatives.

The primary environmental effect of planting is the rapid regeneration of trees. This results in rapid recovery of the visual impacts, return to preharvest levels of water yield, water quality, and time of peak flow, and protection of the soils from erosion. Rapid regeneration limits forage production because of shading and competition from the growing trees. Recovery of big game hiding and thermal cover is quickened.

Insect and disease problems can be minimized by the establishment of a young, vigorous stand of trees. Often, the problems can further be minimized by planting a different species less susceptible or by planting a mixture of tree species. These different species may also enhance the value of the next generation of trees. However, care must be taken to assure that the introduced trees are compatible with the sites on which they are planted.

Planting is labor intensive and costs are high. It is more expensive to plant on slopes of over 40 percent on thin, rocky soils, and on clearcuts because more seedlings are planted per acre. Most of the planting will be done by contract which will directly benefit the local economy.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Planting can have a definite effect on productivity of the next generation of trees by quickly establishing new growth instead of waiting for natural regeneration. This shortens the time for next harvest. Other species, or a mix of species, can be introduced on the site and lessen the loss to insects and diseases. The genetic makeup of the new stand is controlled by planting. If seedlings used are grown from superior tree seed, productivity and resistance to insects and disease should be improved. These activities should not affect the native productivity of the site. Though this rapid growth of timber will reduce the forage available to livestock or big game, it will in time provide the hiding cover and thermal protection needed by the big game.

Irreversible and Irretrievable Commitment of Resources

Because of the expense of planting, it is reasonable to assume that the next generation of trees will be harvested. For all practical purposes, this is an irreversible commitment. The only irretrievable commitment associated with planting would be in cases where trees are not planted or when the planting fails. The fiber production lost during this period of time could not be recovered.

Adverse Effects Which Cannot be Avoided

A small percentage of the plantings on the Forest will fail and this expense is not recoverable. Due to the introduction of other species, the composition of the forest vegetation will change, thus changing a major component of the site environment and interrupting the cycle of nature. Some wildlife species dependent upon the original tree type may be displaced.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

None identified.

Energy Requirements

Some energy will be required in transportation of tree planting crews to the field. This is a small portion of the total energy use on the Forest. The total energy consumption for timber harvest is shown in Table IV-18.

f. Timber Stand Improvement

Timber stand improvement (TSI) is the implementation of any noncommercial intermediate cuttings and other treatments to improve composition, condition and volume growth of a timber stand. TSI is a fairly limited activity on the Custer National Forest. The most prevalent TSI activity is precommercial thinning. Precommercial thinning occurs when the regenerated stand is about 20

years old (too small for commercial products). The objective of thinning is to reduce competition among crop trees so maximum growth per tree is realized. The resulting fewer but larger trees will theoretically be more valuable at the time of harvest. Precommercial thinning on the Forest averages about 150-200 acres per year in the past. This has been more dependent on available funds than on actual needs.

No alternative requires any TSI during the first planned decade. Only Alternatives 6a, 6b, 7 and 8 indicate a projected need in decade 7 (or about 70 years from 1986). One reason is that it often is not cost-effective on the Forest. Additionally, present low timber demand does not justify intensive timber management. Timber stand improvement may be used to help achieve other goals than timber production, such as increasing forage production within a timber stand.

Thinning can have a minor adverse effect on forest scenery until the slash decays or is otherwise disposed of. Change in the timber stand density is not likely to be noticed by the casual observer.

The slash created by thinning is a fire hazard that is difficult to manage. Broadcast or underburning is not possible without damage to the remaining trees, and burning handpiles can cause considerable damage also. Fortunately, the relatively fine fuels are packed down by snow and decay within 1 or 2 years, so the risk of losing the thinned stand to fire is low.

Thinned stands produce slightly more forage for a short time after thinning, but this advantage is soon lost by the rapidly expanding canopy of the remaining trees. Hiding cover for big game may be reduced by thinning, but recovers rapidly as the remaining trees occupy the available space (Thomas and others, 1979). A more or less diverse stand can result from thinning, depending upon the objectives for the species designated to remain as crop trees. If a mix of species is desired, thinning to emphasize one species would be a detriment to diversity and could affect the habitat of certain small animals, birds and insects. TSI can remove harmful insect-infested, diseased, and slow-growing trees, resulting in a healthier and more vigorous stand.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Thinning allows greater fiber production on the remaining trees, thus enhancing long-term productivity. The final product following thinning will be more marketable and useful.

Irreversible and Irretrievable Commitment of Resources

Thinning a stand makes an irreversible (decision to cut down precommercial timber) and irretrievable (tree no longer exists) commitment. It also makes an irreversible commitment to harvest the remaining trees in the stand because of the investment level. In only unique situations would final harvest not occur. Some of the investment may not be retrievable.

Adverse Effects Which Cannot be Avoided

The slash created by thinning will likely not be treated. This will present a fire hazard for a few years after thinning. Temporary losses of hiding cover and protection from cold will affect big game use of the areas, although smaller forest inhabitants may benefit from greater ground debris. The visual resource will be adversely affected for a short period of time.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

TSI could conflict with big game cover management, but the program is so limited that it is not expected. To avoid any detrimental consequences, the Forest Management Plan has guidelines to strike a balance between timber management and wildlife habitat needs.

Energy Requirements

Most of the energy used in precommercial thinning will be used in transportation of crews to the sites and energy to run chainsaws. This is a small portion of the total Forest use. Energy used in commercial thinning is a part of the energy used in regular timber harvest. The total energy consumption for timber harvest is shown in Table IV-18.

2. Logging Methods

The choice of a logging method depends largely on land slope, sensitivity of the soils, needed protection of the visual resources and the type of equipment available. Nearly all logging on the Custer National Forest is conducted with rubber-tired or crawler tractors (dozers). Some small scale cable logging is anticipated in the future. The effects of these two systems are discussed below. Because the tree size is small and lumber quality on the Forest is low, the more expensive logging systems such as high lead cable and helicopter are not expected to be used in the foreseeable future.

a. Tractor Logging

The largest impact from tractor logging is to the the visual resource from the road construction and skid trails used to remove the felled timber. Skid trails are often quite conspicuous, but are revegetated much sooner than constructed roads.

Tractor yarding has the potential to cause soil compaction, excessive soil disturbance, and exposure of soil to wind and water erosion (Megahan, 1980; Rice and others, 1972). Removal of

the organic layers and the understory vegetation bares the soil to raindrop splash erosion and overland flow during intense rainstorms (Bethlahmy, 1967; Megahan, 1980). Compaction can be avoided by limiting tractor use to the dry season, requiring a cushion of snow, or requiring operating on frozen soils. Most topsoils are thin and the displacement or mixing od this topsoil can decrease the fertility of an area. The vegetation removal, plus the inevitable compaction, causes a decrease in infiltration rate, and the resulting overland flow can cause rills or gullies. In these situations, the Forest will apply proper and timely erosion control measures. Generally speaking, tractor logging requires that more miles of logging road be constructed than for other logging methods. The effects of roads are discussed in Section W, Road System in this chapter.

Because tractor operation in streams can have a severe impact on the stream channel and cause excessive sedimentation downstream (Bjornn, 1974), they are not allowed to operate parallel to streams. An increased sediment load in streams causes the intergravel areas to become plugged, reduces insect populations, and causes fish eggs to smother from lack of circulating water (Phillips, 1971; Ritchie, 1972). Stream crossings will be carefully planned to utilize temporary culverts or log or snow bridges.

Cultural resource can be disturbed by tractor logging activities. Although surveys are made prior to implementation of an activity, the scarification of the ground surface can unearth or destroy artifacts indicative of prior human occupation. Coordination efforts are described in Section G, Cultural Resources, of this chapter.

Tractor yarding has little effect on big game cover. However, it generally causes more damage to the residual trees than a cable logging system by injuring the trees left standing. (Lyons, 1979). Forage regrowth may be stimulated by the scarification caused by tractors.

On soils where compaction is not a serious problem, tractor logging may be of some benefit. Exposure of mineral soil is necessary for seedling establishment (Smith, 1962) and tractor logging does expose mineral soil on a significant portion of the area. However, if topsoil is removed by the tractor operation, the productivity of the site is decreased (Froelich, 1979).

Tractor logging is the least expensive method available for getting logs to the yarding area. This can mean a greater profit to the purchaser or, in some cases, a greater return to the U.S. Treasury.

The noise of logging operations can cause local, short-term degradation to the recreation experience.

In alternatives with low timber harvest levels like Alternatives 4, 6, and 8, the environmental effects will be minimized because only a few timber sales will be active at any one time, and these are likely to be scattered throughout the suitable timber land. In alternatives with high timber harvest levels (Alternatives 2, 3, 6a, 7 and 7a), the degradation of the environmental factors is increased. See Table IV-13 for harvest levels by alternative.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The soil disturbance associated with log yarding can degrade the soil's long-term productivity through loss (erosion) or compaction. Regardless of soil type, lower water quality and fish habitat alteration could occur. Compaction (reduced infiltration) will occur primarly on clayey or wet soil, as found on the Ashland and Sioux Ranger Districts in southeastern Montana and western South Dakota respectively. As noted above, the soil scarification is important to regeneration through site preparation, thus improving the site's productivity.

Irreversible and Irretrievable Commitment of Resources

Because the current stand of trees is tractor-logged does not irreversibly commit the area to tractor logging in the next generation. However, if the road system is designed to accommodate tractor logging, there is a strong possiblity that tractors will be used in the future. The soil lost or unduly disturbed by the tractors constitutes an irretrievable loss to the site.

Adverse Effects Which Cannot be Avoided

Tractor logging leaves skid trails which can be unsightly. These trails will usually be revegetated or screened from view by other vegetation. During the logging operation, considerable noise and dust are generated by the tractors as soils are disturbed, reducing the recreation opportunity and possibly air quality. Soil disturbance is followed by a loss in water quality and, perhaps, some loss in productivity.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

The roads associated with tractor yarding can be in conflict with others of the Forest. See Section W of this chapter.

Energy Requirements

The energy requirements for yarding are shown in Table IV-18. Most of the energy use projected for "Mixed" will be used during tractor logging.

b. Cable Logging

Because of small product size and low demand for timber, cable logging has not been utilized to date on the Custer National Forest. Cable logging requires fairly steep terrain, 40% or greater and the logs are dragged uphill by a cable that reaches no more that 800' from the initial landing area.

Some cable programs are anticipated as the system is refined to lessen cost and equipment needs. Cable logging, because the logs are dragged along the ground, has similar effects to tractor logging, but the effect is not as severe because the weight and tread of the tractor is absent. However, skid trails are obvious and a considerable amount of soil disturbance occurs. If cable logging becomes a reality on the Forest, a site-specific environmental analysis would be made to disclose the effects.

U. Minerals — Including Oil and Gas

Many different minerals and energy resources are found on the Custer National Forest. These include oil and gas, coal, uranium, gold, silver, copper, nickel, platinum, palladium, molybdenum, chromite and iron, as well as the more common variety of minerals such as sand, gravel and scoria. Because of public interest in the oil and gas leasing and development program on the Forest, this section has been expanded from that in the Draft EIS.

Additionally, it needs to be noted that the Bureau of Land Management (BLM) is a cooperating agency in the minerals management program on the Custer National Forest. The BLM participates in the NEPA scoping of each proposed lease, coordinates with the Forest Service in the development of the stipulations and normally adopts the Forest Service's environmental analysis and documentation to meet NEPA requirements.

This section is organized to display the impacts that occur through the exploration and development of oil and gas, locatable minerals, coal, and common variety minerals.

1. Oil and Gas

The steps in the exploration and development of oil and gas are leasing, geophysical exploration, exploratory drilling, and development (drilling and production). Each of these steps has its own unique type of impacts.

Currently, the Forest produces about 0.27 percent of the annual National demand. This production involves about 703 producing wells in 86 oil fields which are located almost entirely on the Little Missouri National Grasslands in western North Dakota.

The Bureau of Land Management (BLM) has the only authority to actually administer the leasing of Federal mineral rights. The Forest Service's consent is required to lease minerals rights for acquired lands (previously private-owned). Conversely, if the mineral right is public domain (never privately-owned) only the Forest Service recommendations for surface restrictions is required. The BLM does the actual administrative leasing of both types of ownership. This difference is extremely important in understanding the total leasing picture, see Chapter III, Section 10, Minerals, for more details.

Because the Forest Service does not control the rate or intensity of oil and gas exploration and development, the timing of activities and the level of development are speculative. The lease gives the leaseholder the right to explore and develop it, but does not obligate him to do so. See Chapter III, Minerals Section, for more details regarding the lease status on the Custer National Forest.

Therefore, simply because the mineral right is leased, it does not mean that it will be developed. However, for the purposes of this disclosure and the future management of the Custer National Forest, lease development was assumed to occur in those areas estimated to have a reasonable production potential by industry representatives. The management prescriptions used in the FORPLAN model contained various scenarios for development, depending upon the prescription's emphasis. These scenarios are further discussed in Appendix B, Table B-3. Of particular importance are the lease stipulations specified in each prescription as well as the requirement in some prescriptions to not lease the mineral rights. The option to not lease and, therefore, no development was considered in the development of all alternatives for the Custer National Forest. The Forest Management Plan further explains the leasing requirement for Alternative 10, Preferred Alternative.

Through discussions with industry representatives, an estimate was made of when and where these exploration and developmental activities would occur. It is this timing that is displayed in the oil and gas production by alternative. The projections assumed that leases would develop within a 5-10 year period from the beginning of the Plan period (1980). The volume of oil produced considers only primary production, no secondary or tertiary production.

a. Leasing

Oil and gas related activities generally begin with lease applications and the issuance of leases by the BLM with the consent or recommendation of the Forest Service. The issuance of a lease is a commitment of resources for the term of the lease (five years for competitive leases and 10 years for noncompetitive leases). Leases obligate the Forest Service to grant access to the leaseholder and allow development on the lease. This is why the potential resource impacts of oil and gas development are analyzed as a condition of leasing. To avoid or mitigate any anticipated adverse environmental consequences, stipulations identifying special actions, such as location of well, timing of development activities or surface occupancy are attached to the lease. With these stipu-

lations attached to the lease, developmental activities must be within these terms. The effects of leasing are discussed in the following section and have also been evaluated in Unit Plans completed for the Forest between 1974 and 1980. Unit Plans recommended for or against leasing and established what stipulations were needed under which situations. These stipulations have been attached to leases let during the past 12 years. Unit Plans are incorporated by reference into this FEIS.

The extent to which leases applications are received and processed depends upon the probability of oil or gas production and the probability of any one lease being developed is unknown. In the Williston Basin (under the Little Missouri National Grasslands in western North Dakota) many areas have been sampled by exploratory wells, or "wildcat wells" and high percentage of the areas have become productive fields. Other areas on the Forest have less proven production, although nearly all mineral rights have been leased. The Sheyenne Ranger District in eastern North Dakota is an exception; no leases occur there. The Pryor Mountains of the Beartooth District in south-central Montana have very few leases issued in them. This is a reflection of relatively low probability of oil reserves. The Sioux Ranger District in western South Dakota and eastern Montana contains some producing wells and drilling is expected to continue. The Ashland Ranger District in southeastern Montana has a number of nonproducing wells. The Beartooth Ranger District south central Montana is expected to have some oil reserves associated with the Overthrust Belt. In these areas of proven production, there is a very high probability that any undeveloped leases will be developed. In areas that have not been explored by exploratory drilling there is a good chance that some of these areas will be drilled if geophysical data indicates a high potential for finding oil. If a wildcat well discovers a oil source, the extent of the discovery will be determined by subsequent developmental drilling. If no discovery is made, the well is usually abandoned and other drilling would be limited to obtaining "down hole" information.

It has been the policy of the Custer National Forest established through Unit Plans and standard operating procedures to analyze the lease's surface situation prior to recommending or consenting to its issuance. Site-specific stipulations regarding surface occupancy on each lease have resulted that protect or mitigate adverse impacts to resource features, such as key wildlife habitat, woody draws and riparian areas, sensitive ecosystems (such as upland breaks in North Dakota) or visual settings. It is these requirements that are a part of every alternative to varying degree. The Forest Management Plan specifies the required stipulations for various Management Areas as interpreted for Alternative 10, Preferred Alternative. These specific stipulations are in addition to a number of other stipulations included in all leases identifying general resource concerns. Before a lease package is forwarded to the BLM for issuance, the following precautionary steps are taken:

The parcel(s) of land covered by the lease is checked against the land ownership record to make sure the mineral rights are owned by the Government and that there are no encumbrances on the minerals ownership.

The location of the parcel is checked against the Unit Plan (In the future, the check will be against the Forest Plan) direction to see if it is available for leasing and what stipulations are required. The area is evaluated on aerial photographs and topographic maps. If this interpretation indicates a special concern, the area is inspected on the ground. Specific stipulations may be identified to protect the intent of management direction. These may include such things as: (a) No Surface Occupancy to protect developed recreation sites, (b) seasonal restrictions to protect areas used by wildlife, or (c) restrictions to protect scenic values.

If slopes in excess of 40% may be encountered, a stipulation is added that does not allow surface occupancy on slopes in excess of 40%.

If there are woody draws or riparian areas on the parcel, a stipulation that prevents surface occupancy of riparian areas and woody draws is added.

If the area is identified as critical to wildlife, seasonally, or for some other condition, a stipulation is added to protect the wildlife values. This may be a timing restriction representing sensitive seasons such as lambing, calving, breeding or nesting seasons.

In addition to special stipulations, there are a number of general stipulations that are included in all leases to protect resources that may not be identified at the time of leasing. These include requirements to protect cultural and paleontological values, nests, water quality, and aquifers.

Alternatives 2, 3, and 7, all of which emphasize a high level of commodity outputs and produce between 345 and 344 million barrels of oil, would have the greatest amount of leasing and subsequent development of the oil and gas resources. These alternatives accomodate oil and gas development through area planning, limited surface

restrictions, and acknowledge acceptable impacts to other resource. There would also be high returns to the Federal treasury.

Alternative 8 has the lowest level of oil and gas activity, as indicated by its low level of oil production, 166 million barrels of oil. This significantly lower production than Alternatives 2, 3, and 7 is due to the vast amount of acres in a Minimum Level management strategy, reducing lease administration and field reconnaisance. In fact, no leasing is made in a Minlevel scenarios and only the existing production would continue until depleted.

Alternative 1 also produces a lower level of oil than Alternative 2, 3, and 7 (301 million barrels of oil) not because of minimum level management asin Alternative 8, but because of the Alternative's emphasis of wildlife management. This emphasis requires significant surface restrictions, or stipulations, in the oil and gas leases. These stipulations, including No Surface Occupancy, are estimated to reduce overall oil production. See Table IV-22, Cumulative Oil Production, in Section d, Development, which follows.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Oil and gas leasing is the activity that allows for the short-term (5 or 10 years) opportunity to develop energy resources for the Nation. Without leasing, the oil and gas resources are unavailable for the public's consumption. Although there are no direct environmental effects of issuing a lease, it is a commitment of the Government to allow development of that subsurface resource. It is this development that has significant environmental consequences. See following Section d, Development, for the environmental effects discussion.

Irreversible and Irretrievable Commitment of Resources

The act of leasing is considered an irreversible action for the life of the lease (5 or 10 years depending on type of lease) and is a commitment to allow exploration and development within the terms of the lease. If an area is currently leased, but no development occurs within its timeframe of 5 or 10 years, the lease will expire. There is no commitment to lease the mineral right again. The decision to reisuue or not reissue depends upon many factors, such as production potential and surface needs. The Forest Management Plan describes the situation when leasing would not recommended or consented to.

Adverse Effects Which Cannot be Avoided

Many potential adverse environmental effects that could occur during oil and gas development are recognized and mitigated by the appropriate lease stipulations which control on-lease activities. However, many older leases do not contain stipulations that may be considered necessary today as environmental concerns and knowledge have changed over the past 10 years. Unless the developer of these old leases is willing to voluntarily agree to new surface restrictions, there are no binding requirements for any special requirements. New lease stipulations can only be added before the lease is issued. They cannot be added to an existing lease that is held by production but mitigating measures can be negotiated in the Application for Permit to Drill (APD) process. See the following Section d, Development, for details of unavoidable effects from oil and gas development.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

The guidelines of other land management plans are usually incorporated into lease stipulations. Conflicts could arise between leasing and wilderness recommendations, roadless areas or wildlife management. The Forest Plan clearly explains the requirements to mitigate or avoid conflicts, primarily through the use of the lease stipulations or recommending withdrawal from mineral entry.

Energy Requirements

Leasing does not require a significant amount of energy. Some is required for on-the-ground inspections of the area to determine appropriate surface stipulations for the lease.

b. Geophysical Exploration

Geophysical exploration may be a pre- or post-leasing activity. A lease is not required for geophysical exploration to occur. Specific exploration techniques include gravity and magnetic surveys, vibroseis, surface charge and conventional. Exploration activities may take place over the same area many times and continue over a number of years. An area of interest is usually identified by preliminary geophysical lines run at relatively wide intervals. This spacing is narrowed as the target area becomes better defined, and generally happens over a period of one to three years. Each exploration project is allowed by a special use permit which identifies concerns and requires site specific mitigation measures. Such measures may include timing restriction to avoid wildlife displacement, public safety warning signs or traffic control, shot point rehabilitation, and property protection (fences, wells, or underground utilities).

It is difficult to predict which technique is more prevalent on the Custer National Forest. The factors used to determine the type of exploration needed depends upon the accessibility, surface topography and data available. It is not the responsibility of the Forest Service to determine the appropriate type of exploration. Although through experience, the agency has recognized impacts produced by the various methods. A dis-

cussion of each of the methods follows wihh an explanation of the resource impacts.

Gravity and magnetic surveys are used for regional or area surveillance to identify subsurface formations that may hold oil and gas. This method takes instrument readings at regular intervals across the lands from either ground vehicles or airplanes. No actual surface disturbance is involved unless off-road vehicle travel is utilized to access the survey points. Information from these surveys are further refined by seismic exploration techniques.

Vibroseis exploration uses large trucks equipped with vibrators. The vibrator is attached to the frame under the truck and is lowered onto the ground at predetermined locations on a level surface. This is usually on existing roads or on flat, easily accessible land. Vibrations are sent through the ground and the returning sound waves are picked up by geophones placed along the seismic line, wired into another truck equipped with the recording devices. Roads are not generally built to accomodate this activity. If the existing topography does not allow vibroseis, another technique is substituted. There is little if any resource disturbance with this type of exploration.

Surface charge seismic projects are accomplished by placing explosive charges on the ground or above the ground on wooden stakes about three feet tall. These charges are detonated and again these returning vibrations are picked up by seismic geophones, wired into a recording truck. This system of collecting data can proceed relatively fast, and a crew may shoot (detonate) several miles of line in a day, depending on the topography of the area. No new roads are needed for this technique. Most of this work is accomplished with hand labor, no machinery is need to set the charges. In areas where vehicle access is difficult or impossible, equipment is often transported by helicopter. Resource damage from this kind of exploration can include destruction of underbrush for about 5' diameter around the shot point, shaking off of upper leaves of overstory trees, some soil disturbance along the ground charge line, some wildlife displacement during the setting and shooting of the seismic line, and some disruption to the recreation experience within hearing distance of the shot points and the helicopters, if used.

Conventional seismic exploration drills 4-inch holes into the earth at a depth of 50 to 200 feet. A tube(s) of explosive (or stick(s) of dynamite) is placed in each hole, then detonated. The returning sound waves are recorded through geophones. This has the same general effects as surface charge seismic. The need to get a drill rig to each shot point requires off road travel with heavy trucks. No roads are generally built to accommodate drill-rig laden vehicles. This can create many trails across reasonably flat land resulting in some soil movement and compaction and vegetation loss.

If vehicular access is infeasible (i.e. no road construction is made), the crew members can carry portable drills or the crew and equipment can be airlifted by helicopter along the seismic line. The cuttings from the drill holes are usually scattered around the shotpoint hole after drilling is completed. This results in some loss of vegetative production for a few years. Similar to surface charges, wildlife can be displaced during this activity and the recreation setting can be disturbed, especially with the use of helicopters. The shot holes are plugged from top to bottom with bentonite or other suitable material to prevent accidents and contamination of underground aquifers.

The amount of geophysical exploration is not projected in the alternatives. Exploration is needed prior to development, but its level will vary depending upon the characteristics of the geologic formation under study. This was an infeasible analysis to make in the realm of Forest planning, however, geophysical exploration is assumed to occur in every alternative.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Other than increased traffic in an area, the vibroseis technique usually has few visible environmental effects. The special use permits granting seismic activities contain requirements, such as curtailing activities during wet soil conditions or high traffic times, such as weekends. Soil compaction may result from off-road travel by heavy equipment.

Surface charge techniques may result in some loss of vegetation at the point of the shot. Some debris is left, such as broken pieces of wooden stakes and wire, although the special use permit will specify reasonable trash removal from the seismic line and staging area. There are usually no long-lasting effects in areas of gentle terrain. On steeper terrain, the results of driving vehicles cross country can result in wheel tracks which may inadvertently become unplanned roads. The recording trucks are usually equipped with winches that allows traveling difficult and wet terrain. Streams and other wet areas may be damaged where ground conditions are most fragile. The damage from surface charge seismic activity can be reduced by the restrictions identified in the permit which may include vehicle travel on suitable terrain only. When this type of restriction prohibits the use of trucks, the equipment is then transported by helicopter.

Because conventional seismic exploration requires drilling, the drill cuttings are piled on top

of the ground and usually scattered after operations are complete. Topsoil can be buried, which results in some loss of vegetative productivity. The cuttings can also form a "mud cake" through which grass cannot grow for several years. Drilling and shooting can result in damage to shallow aquifers, which can have a long-term impact on springs and wells in the area.

Irreversible and Irretrievable Commitment of Resources

The explosives and energy fuels consumed in conducting seismic activities are irretrievable commitments of resources. The actual drill hole is refilled with a slurry of cuttings and bentonite which introduces a different component in the land's composition. Merely searching for oil and gas reserves does not commit them to development.

Adverse Effects Which Cannot be Avoided

The explosion of seismic charges results in noise pollution as does the truck and helicopter traffic. This increased noise and activity in an area can result in disturbance to wildlife, recreationists, residents, and livestock. Some of these effects are mitigated by controlling the time of year, week or day that detonation is permitted.

There is some risk of injury to other forest users if they are in the immediate area when seismic charges are detonated. Noise and risk from the subsurface detonation charges are less than with surface charges. The loss of a small amount of habitat by crushing of grasses and forbs cannot be avoided.

In very rough topography, most of the seismic work is done by hand, slowing the progress and lengthening the period of disruption. This may result in longer displacement of wildlife and a greater inconvenience or risk to other users.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

During critical periods of time (i.e. booming, nesting and lambing) seismic exploration can be direct conflict with these other resource needs. The management of livestock can be disrupted if fences and gates are cut or not closed. Similarily, livestock may be spooked by the explosions and cause injury to themselves or facilities.

Energy Requirements

Conventional and surface charge seismic programs require significant vehicular support to transport workers and supplies to remote locations. Helicopter program require support ground teams. As a result, more fuel is consumed collectively . These costs are considered industry's responsibility. Some Federal obligation of energy is made for administration of the exploration permit and subsequent rehabilitation. The total energy consumption for oil and gas development is displayed in Table IV-24, in Section e. of this discussion.

c. Exploratory Drilling

An exploratory oil and gas well, or "wildcat" well, is necessary to locate an oil and gas reservoir. Within many portions of the Forest, these wells must be drilled to depths of 12,000 to 15,000 feet. To transport a drill rig capable of drilling to these depths requires a suitable road capable of handling 30 to 40 semi-trucks and trailers (low-boys) of heavy equipment and 20 to 30 vehicles per day. A level drill pad of about two to five acres is needed to set up the rig. This drill pad must meet very tight specifications for shape and grade. It usually measures about 380 feet by 250 feet. On steep topography, this may require the movement of a large amount of material to insure the pad rests on existing or "cut" surface. Fill surface is not suitable to insure safety of operations. To mitigate some of the possible long-term effects, the well pad dimensions can be altered to more closely fit the natural contours, topsoil can be stripped and reserved for rehabilitation and cut/fill surfaces can be rounded for stability and esthetics.

The differences in exploratory drilling among the alternatives is not projected, but the activity is assumed to occur in all alternatives. "Wildcatting" is common when a geologic formation is discovered and an oil and gas reserve is expected. As more development occurs in a production unit, the amount of wildcatting decreases.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Wildcat wells are the first stage of development in a previously undeveloped area. This may change the opportunity for dispersed non-motorized recreation to motorized because of new roads. Drilling requires many support activities and once started, it usually continues 7 days a week, 24 hours a day. The leveling and grading of the drill pad and necessary road construction may require the movement of large amounts of material, especially on steeper ground where erosion is imminent. Soil productivity and vegetation growth will be severely limited until rehabilitation is completed, usually within three months. If the well does not produce, the site is reshaped and revegetated immediately. The productive potential of the disturbed soil is usually less than undisturbed soil in the long-term. If the well does produce, a portion of the drill pad needed to continue production can be expected to remain in place for 50 to 100 years; thus eliminating those acres from any type of vegetative production.

Additional drilling can generally be expected to determine the size of the field. If there is sufficient production, then facilities to produce and trans-

port the oil, gas, and water will be built and the field moves into a development phase. Therefore, the exploration well reveals another source of energy reserves. The long-term productivity of the subsurface resources is enhanced by this activity.

Irreversible and Irretrievable Commitment of Resources

The fuels needed to develop the road, drill pad, and well are an irretrievable commitment of resources. Drilling fluids and additives are also an irretrievable commitment of resources. The drill hole, if abandoned, is filled with bentonite, and will always contain some drill casing, particularly in the upper levels of the hole. The abandoned well site is rehabilitated and marked on the surface, usually by an iron post of some sort with identifying information. If productive, the well is usually committed to production. However, in light of world oil prices, the well may be capped and the oil not extracted.

Adverse Effects Which Cannot be Avoided

The need for building access roads, leveling the drill pad, and drilling the well are all required actions in the development of an exploratory well. The ground disturbance required by these activities has effects that cannot be avoided. The noise from all this activity and equipment and the creation of smells from engine exhausts cannot be avoided. Some unavoidable soil losses will occur due to erosion and dust. There will be a loss of vegetative production on disturbed area until rehabilitation is completed.

Whenever a well is drilled, there exists the possibility of penetrating a geologic formation that contains abnormally high pressures. When this occurs, the well could "blow out", even though reasonable precautions are taken. If this happens, saltwater and gases are normally blown from the well and adversely affect air quality and the surrounding soil and vegetation. There is also a risk that unanticipated aquifers will be interrupted and the quality of the ground water could be reduced. This is generally not a problem because the drilling fluids used until the well is very deep are of a appropriate quality so they do not contaminate fresh water acquifers.

Because drilling may continue around the clock, seven days a week, wildlife is usually displaced from the immediate area during drilling. On an average, a well rig can be expected to be in place and operating for about 30-60 days. If problems are encountered the rig may be in place and operating longer. Recreationists, including hunters, will probably avoid the immediate area during drilling as the sound of a drill rig is detectable for a considerable distance, adversely affecting an anticipated outoor and hunting experience.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

Other land use requirements are usually incorporated into the lease and its stipulations. The requirements of a wildlife management plan may preclude leasing, or may require that development occur during a noncritical time of the year. However, if drilling in an area may take a year or longer, it could continue into a critical time for wildlife. If production is established, year-round activity will occur. The Forest Plan identifies critical season for various wildlife species so that disturbance is minimized or avoided. Visual resources may also be adversely affected by the well pad construction and the resultant well if production is found. As the visual setting is changed, so is the recreation opportunity.

Drilling for oil and gas in areas of high public interest such as the Beartooth Mountains, especially the first well, may be in conflict with established public uses or priorities for the area. Often times, a greater public understanding is necessary to ensure adequate controls on the drilling operation. When drilling occurs the potential adverse impacts will be mitigated to the extent possible within the terms of the lease.

Energy Requirements

Drilling a well and the related earth moving for roads and well pads requires the consumption of large amounts of fuels, although not a responsibility of the Federal government. The energy requirements of oil and gas development is shown in Table IV-24.

d. Development

The Custer currently has 86 oil fields, encompassing 302 Federal leases and 703 producing wells. These fields lie in the Little Missouri National Grasslands, overlying the Williston Basin in western North Dakota. There are three producing wells in the North Cave Hills portions of the Sioux Ranger District in western South Dakota. No field development has occurred nor is expected on other portions of the Forest until exploratory wells indicate a reserve.

Development of an oil field generates the next phase of oil and gas development activity. Roads are upgraded to permanent all-weather specifications, top soil is respread on road slopes, and well pads are rehabilitated to production size (smaller than drilling size, approximately 2 acres). If needed, additional space is provided on or near the well pad for storage tank (oil and water). Sometimes a tank battery (a collection of tanks) is built to collect the production from a number of wells in the vicinity. These temporary storage tanks are used until the volume of production is established, and the liquids are trucked out at

regular intervals until pipelines are installed to transport the products.

Although individual States establish the well spacing for any given field based on the geologic structure being tapped, wells are usually spaced on 160 or 320 acre spacings, two or four wells per square mile (section). This usually requires about 2 miles of road per square mile. These roads usually have a 14 to 24 foot wide running surface and are designed for year-round use.

Development of Federal minerals is a necessary function to supply energy to the Nation. The world supply of oil plays an important role in determining the extent of development on public lands and the extraction of Federal minerals returns significant royalties to the Government. The 45+ years of oil and gas development on the Custer National Forest has created policies and standard operating procedures to avoid and mitigate unaccpetable environmental consequences.

A by-product of oil and gas development is the release of the natural gases associated with oil reserves. These gases (methane, butane, propane and hydrogen sulfide) can have undesirable, even fatal, effect on man and animal; they are toxic and corrosive. They may be flared at the well head if a pipeline is not available to transport it for refining or vented into the air, having possibly fatal consequences to man and animal.

Oil and gas development can displace wildlife and alter the wildlife habitat. Some habitat loss may occur particularly if key habitats such as woody draws or riparian areas are disturbed. See Section e, Effects of Oil and Development on Deer, of this chapter, for more details. Specific effects on wildlife are evaluated in detail through project level planning and in general are reflected in outputs in Chapter II.

Range and livestock management can directly and indirectly be affected by development. Direct effects include removal of vegetation by road and well pad construction. Dust from vehicle traffic can further reduce available forage. Damaged gates and fences can allow livestock to stray.

Released H_2S (hydrogen sulfide) can kill cattle if a sufficient supply of fresh air is not available, such as in low draws or gullies. Increased traffic levels can also result in livestock death. However, the roads associated with oil development have indirectly allowed livestock to graze in previously unavailable areas.

If the area being developed has previously been roadless or managed as low development, the roadless character is lost for several decades. See Table IV-3, Deposition of Roadless Areas for the changes in status for each of the inventoried roadless areas.

Important to this issue is the Forest's policy on offset drilling in areas previously designated as Essentially Roadless Areas (ERA's) or other special areas that through Unit Plans established cut-off dates for lease development. This policy, issued October 24, 1980, clarifed the opportunity to develop leases in ERA's, is applicable to all alternative in which ERA's are retained as roadless or low development areas and states:

"If there is a discovery in an ERA prior to the surface occupancy date, development may continue by offset drilling on the adjoining production units (e.g., 320 or 160 acres) on the same or adjoining leases within the ERA's. Offset drilling will be allowed until the limits of the 'discovery' pool are defined through dry or nonproducing holes.

Discoveries made outside of ERA's will not be allowed to progress into ERA's unless the United States Geological Service (USGS) determinines that additional drilling is necessary to protect the federal mineral estate."

The policy goes on to state that access to state and private lands and private minerals under Federal surface is a legal right and accomodated by Forest Service policy. In any case, the intent will be to minimize encroachment into the ERA's.

No new cut-off dates are proposed in any of the alternatives, so this policy applies only to those areas with an established cut-off dates. These areas are:

Essentially Roadless Areas	*Cut-off Date*
Ash Coulee (ND)	May 31, 1982
Bell Lake (ND)	February 28, 1981
Bennett-Cottonwood (ND)	July 31, 1981
Bennie Peer (ND)	April 30, 1981
Bullion Butte (ND)	December 31, 1980
Cheney Creek (ND)	April 30, 1981
Cook Mountain (MT)	July 1, 1985
Horse Creek (ND)	April 30, 1981
King Mountain (MT)	July 1, 1985
Kinley Plateau (ND)	December 31, 1981
Lone Butte (ND)	December 31, 1980
Magpie (ND)	August 31, 1982
Ponderosa Pine Area (ND)	May 31, 1981
Strom-Hansen (ND)	January 31, 1982
Twin Buttes (ND)	December 31, 1981
Wannagan (ND)	December 31, 1981

If an ERA remains in a roadless or low development status in an alternative, this policy applies. If an ERA is dropped from a roadless or low development status, the policy no longer applies to that area. If a new area, not previously an ERA with an established cut-off state, is designated for roadless or low development status, the terms of the current lease, if there is one, is valid and the offset policy is not applicable. The mineral rights underlying the areas proposed for roadless or low development management in the Preferred Alternative have been withheld from leasing pending the outcome of the Forest planning effort. The

intent is to maximize the possibility of preserving the roadless or low development areas. The Forest Management Plan addresses this situation for every Management Area, not only the roadless or low development areas, whose goal may conflict with the leasing situation.

See Chapter II, Section 11, Minerals, for more discussion of the offset policy and Table IV-3, Deposition of Roadless Areas by Alternative for the status of the various inventoried roadless, or previously named Essentially Roadless, areas.

Most roads developed for oil and gas exploration, development, and production are built under special use permit issued by the Forest Service. Roads needed for oil and gas production are directly related to the amount of land leased for oil and gas production. These roads are rehabilitated after production (30-50 years) is complete, unless they are needed for long-term renewable resource management. Some roads that are presently scheduled for rehabilitation may be retained after oil and gas production is complete, depending upon the needs of the public. When the need for the road is gone the road is closed, reshaped, and revegetated. (See Section P, Special Uses, and Section W., Road System, of this Chapter for more discussion of environmental effects of roads and Chapter II, Section D, Comparison of Alternatives, item 12, Road System for a discussion of road management requirements for all alternatives.)

The level of development is reflected by the total expected level of oil production, as shown in Table VI-22.

Oil production is determined by how much land is leased for oil and gas production, the world oil market and, to a lesser extent, the stipulations that may limit or preclude development of some areas. Alternatives 2,3, and 7 all have high levels of oil production because of their emphasis on commodity outputs. Conditions supporting these levels include emphasis on mineral management, pre-planned area development, limited or general surface occupancy stipulations, and an accepted level of impacts to other resources. Alternative emphasizing non-commodity values, such as wilderness, wildlife or roadless (Alternatives 1 and 4) or having significantly reduced funding (Alternative 8) produce lower levels of oil through the 75 year planning horizon.

The full impact of withdrawing roadless areas from mineral entry is not readily visible in Table IV-22, although Alternatives 1, 4, 5a, and 5c have significant wildlerness designation. Because most of the Forest is currently leased and these leases would be honored, the leaseholder is entitled, as assumed for purposes of this analysis, to establish production prior to wilderness classification. Therefore, the oil production projections can not reflect immediate mineral withdrawal and a shut-dwon of existing oil wells.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

When a well is developed that is economically feasible, the area needed to continue production can be expected to be committed to that use for 30 to 50 years. The area of the production drill pad and related access roads will be out of vegetative production for this length of time. The development well likewise begins depletion of the Nation's reserve of oil and gas, while providing energy to the public. There will also be a short-term loss of vegetation and possible erosion from installing pipelines and electric transmission lines servicing the oil fields. A longer-term effect on soils and vegetation could occur from spilling production fluids (oil and saltwater).

H_2S and SO_2 emissions from oil/gas wells are generally localized and of short duration, but new wells and occasional leaks tend to perpetuate the hazard to human and animal life and vegetation. Sources are mostly from new wells and thus are continually being relocated. In addition, a chronic low-level emission occurs at most sweetening plants and pumping stations. This release may have a long-term detrimental effect on vegetation. Some plant species appear susceptible to injury by short term exposure to H2S; others are not noticeably effected. Regrowth may occur in the short-term, but H2S effects on vegetation are not clearly defined at this time.

Irreversible and Irretrievable Commitment of Resources

The removal of the oil, gas, and other associated fluids is an irreversible and irretrievable commitment of the resource. Saltwater produced along with the oil and gas may be pumped back into the geologic production zone to help maintain reservoir pressure and enhance production. The natural gas produced along with the oil and saltwater may be burned off if no pipelines are available to transport it.

The use of oil and gas is an irretrievable commit-

TABLE IV-22

CUMULATIVE OIL PRODUCTION

(Millions of barrels of oil over a 75 year period)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Barrels of oil	302	345	345	315	334	325	330	331	337	336	332	344	342	331	167	338	316	351	0

ment, and the temporary local effect on air is neither irreversible nor irretrievable. The same rationale applies to other activities which cause short-term local effects on air quality. However, the long-term effect of regional air pollution will be to contribute to an estimated growing problem of acid rain across the northern and northeastern portions of the United States.

Adverse Effects Which Cannot be Avoided

As with any major activity, there is always a risk of accidents, and the development of oil and gas is no exception. The activities associated with oil development can be hazardous to employees, Forest Service personnel and animals. Physical injury may be more probable with increased traffic (large trucks and passenger vehicles) overhead hazards (powerlines, cranes, drill rigs) and poisonous gases at well heads. Safety devices including H_2S monitors and oxygen mask kits are provided for Forest Service personnel working in these areas and wind socks and warning signs are displayed for public warning.

It is the responsibility of state agencies (usually an Air Quality or Public Health Board or Industrial Commission) to monitor gas emissions at well heads. The Forest Service will cooperate with any recommendations for air quality management. The Forest Management Plan details the Forest's policy for air quality.

The effects on vegetation from hydrogen sulfide are not clearly defined at this time. Vehicular and pipeline transportation of liquids and gasses are susceptible to accidental spills. Some of these liquids are quite toxic and may result in soil sterilization.

The level of development, including roads, pipeline corridors, and drill pads, has an adverse effect on the scenic value of an area. Some of these effects are mitigated by design methods and the location of facilities, but the net result is a change in the natural landscape. Table IV-23 displays the acreage expected to be classed as "disturbed", by alternative and time period. These acreages reflect the results of all Forest activities, although oil and gas development accounts for the vast majority of changes.

Existing Visual Condition Class 4 (disturbed) is used as an indicator of how the Forest will appear in the future. The more acres in EVC 4, the more evident the impact of man is on the natural-appearing landscape. The acreage in EVC4 generally decreases over time as oil and gas development impacts are rehabilitated. Maximum Present Net Value has the maximum acres in EVC 4 over time because this benchmark is designed to optimize outputs that have a positive benefit-cost ratio, with little effort spent on the mitigation of impacts. Alternatives 1 and 4 have the least acres in EVC 4 over time as they are noncommodity oriented alternatives with signficant emphasis on mitigating or avoiding adverse visual impacts. The rest of the alternatives are very similar in the number of acres in EVC4.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

As oil and gas development continues to increase, the opportunity for violation of air quality standards and guidelines increases. As closer monitoring occurs and base lines are established it is quite possible that violation of air quality standards will be found.

Energy Requirements

The developing oil and gas reserves is a high energy-consumption activity, although consumption decreases after production is established. If fluids must be trucked from the site, rather that piped, consumption remains high. Some energy is required to reduce air pollution by treating the toxic gases released during production. Table IV-24 displays the expected energy consumption of oil and gas production.

e. Effects of Oil and Gas Development on Deer

Because of the public interest in wildlife management, a special computer model was developed to evaluate the effects of oil and gas development on deer. This model utilized the information developed through FORPLAN yield tables and management prescriptions. See Appendix B for more information on the planning process and FORPLAN.

Information provided by the State Fish and Game Departments of Montana, North Dakota, and South Dakota biologists, research publications, and other documents, was used to predict effects on mule deer.

TABLE IV-23
EXISTING VISUAL CONDITION CLASS 4 (disturbed)
(M acres)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
EVC-4 (Disturbed)																			
Decade 1	219	272	277	249	270	253	265	265	268	265	263	271	266	259	146	269	262	359	0
Decade 3	172	230	234	209	226	210	222	221	224	222	220	229	224	218	112	224	208	389	0
Decade 5	162	220	224	201	218	202	214	214	215	213	211	219	214	209	106	216	197	398	0
Decade 7	154	214	218	196	213	197	209	208	209	207	206	213	209	203	100	210	187	403	0

Information incorporated into the deer model included: (1) Population data from the various State Fish and Game Departments that takes into consideration the composition of the ecosystem and where it is located on the Ranger District; (2) Probability of oil and gas development occuring in an area; (3) Assumptions about the intensity of oil and gas development including estimated number of wells and miles of road per square mile (this assumption was four wells and 2½ miles of road per squre mile, the most probable level of development); (4) Present deer population of each Physiographic Area (PA) and the ecosystem composition of the PA (The individual ecosystem is too small to determine deer populations. The ecosystem composition of the PA is critical, since it reflects the vegetative diversity within a definable area. See Appendix B, Section II, Inventory Data and Information Collection, for information regarding ecosystems, analysis areas and PA's); and 5) Size estimate of affected area (considering line-of-sight distances, traffic effects and size of deer "zone of influence").

State and Forest Service wildlife biologists worked together to estimate the area of impact on deer in the vicinity of oil and gas development. With the assumption of four oil wells and two and one half miles of road per square mile, the model was developed to determine the effect on every analysis area on the Forest. The physical and vegetative differences of the various analysis areas were a major consideration. Using these assumptions and knowledge, the results indicated that full scale oil and gas development in every section could reduce carrying capacity by 40 percent. This is an extreme test, but allowed a starting point of analysis for the alternatives.

None of the alternatives show this drastic a reduction in deer numbers because in no case is every section of land assumed to be fully developed. On most of the Forest it is anticipated that 20 percent or less of any Ranger District will ever be impacted by oil and gas development. If this were occur, creating a 40% reduction in deer numbers, the maximum effect on the entire Ranger District would be a reduction of about eight percent. Since oil and gas development will not occur on all Ranger Districts at one time and will vary in impact, the total effect on a Forestwide basis could be insignificant.

When analyzing all of the Custer National Forest lands, it becomes evident that the oil and gas developmental activities and related transportation facilities are only one many effects that influence deer populations. The activities associated with oil and gas are very visible and have impacts on the environment that are similar to timber harvest because of the necessary roads and vegetative recovery time. Roads for oil and gas, like for timber harvest, may be retained if they will be needed for future management (see Chapter II, Section D, Comparison of Alternatives, Item 12, Road System, for a discussion on road management). There is no doubt that the development of oil and gas adversely affects wildlife populations in the short-term, but this analysis indicates that it would be very unlikely to reduce deer numbers more than eight percent Forestwide. The length of time that the impact is the heaviest is rather short in duration, generally much shorter than with the harvest of timber.

The most significant variable in the Forest is the natural cycle of deer populations and weather conditions. A severe winter, when the population is high, has the potential of reducing deer numbers to a minimum viable level without any influence from man.

TABLE IV-24

ENERGY CONSUMPTION FOR OIL AND GAS DEVELOPMENT

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Oil and Gas Development (Thousands of gallons of gasoline)																			
Decade 1	407	536	541	504	516	518	493	511	527	522	513	536	534	520	219	527	496	568	2
Decade 3	61	77	77	72	77	75	72	77	75	75	72	77	77	75	34	77	70	81	0
Decade 5	20	27	27	25	27	25	25	27	25	25	25	27	25	25	11	25	26	27	0
Decade 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Oil and Gas Development (Thousands of gallons of diesel)																			
Decade 1	2706	3563	3593	3352	3427	3443	3277	3398	3503	3473	3413	3563	3548	3458	1458	3503	3299	3773	15
Decade 3	406	511	511	481	511	496	481	511	496	496	481	511	511	496	226	511	462	541	00
Decade 5	135	180	180	165	180	165	165	180	165	165	165	180	165	165	75	165	174	180	00
Decade 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oil and Gas Development (Millions of kilowatt hours of electricity)																			
Decade 1	15.5	20.3	20.6	19.2	19.6	19.7	18.7	19.4	20.0	19.9	19.5	20.4	20.3	19.8	8.3	20.0	18.8	21.6	0.0
Decade 3	2.3	2.9	2.9	2.7	2.9	2.8	2.7	2.9	2.8	2.8	2.7	2.9	2.9	2.8	1.3	2.9	2.6	3.1	0.0
Decade 5	0.8	1.0	1.0	0.9	0.1	0.9	0.9	1.0	0.9	0.9	0.9	1.0	0.9	0.9	0.4	0.9	0.9	1.0	0.0
Decade 7	0.0	0. 0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Road Construction (Thousands of gallons of diesel)																			
Decade 1	244	603	616	215	428	492	478	485	600	608	597	625	613	597	429	600	600	596	000
Decade 3	69	163	162	69	111	110	125	110	154	156	155	158	164	159	102	156	143	182	000
Decade 5	7	12	2	5	6	8	8	6	6	6	8	10	79	8	2	4	6	6	0
Decade 7	2	6	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	0

2. Locatable Minerals

The General Mining Law of 1872 provides for the location, exploration and development of locatable minerals on public domain lands that are not withdrawn from mineral entry. The Beartooth Mountains in southern Montana contain the highly mineralized Stillwater Complex, which contains the Nation's largest known platinum and chrome deposits and the second largest nickle deposit. This area has seen varying levels of activity for many years. The amount of locatable minerals activities is not projected in this EIS analysis. The mineral existence is recognized as well as the associated mining activities in the Forest Management Plan. (For further information, see the Managment Plan direction for Minerals and Management Area E.)

A project EIS has recently been completed (1986) jointly by the State of Montana and the Custer National Forest for the development of a platinum-palladium mine, referred to as the Stillwater Mine, in this mineralized zone. The state permit allowing development has been issued. Reasonable and necessary mitigation measures were identified in the project EIS and these measures are incorporated by reference into the Forest Plan.

There are other areas of locatable minerals on the Forest that are available for location, exploration and development. All public domain lands, except the Absaroka-Beartooth Wilderness, are open for mineral entry. The Pryor Mountains of south central Montana currently contain many mining claims, mostly uranium. Likewise, uranium claims are scattered around the Sioux Ranger District (South Dakota and Montana).

Mining claims cannot be made on acquired lands, which comprise the vast majority of the National Grasslands administered by the Custer National Forest.

The largest single impact on the opportunity for exploration and development of locatable minerals is the classification of lands by Congress to Wilderness. Classification of lands to Wilderness would make prospecting, exploration, and development of locatable minerals very difficult because of the requirements included in the Wilderness legislation. There are currently 180 mineral claims in the Custer National Forest portion of the Absaroka-Beartooth Wilderness. These claims have been located for chrome, platinum, palladium, molybdenum, and copper with associated minerals. The Wilderness was withdrawn from mineral entry as of December 31, 1983 and a discovery had to have been made prior to that date. These claims within the Wilderness will be examined to determine if a discovery had been made (validity examination). Locatable mineral extraction is not estimated to make any dramatic changes during the Plan period (10-15 years).

Prospecting is expected to continue as a low-key program across the Forest. Any major mining proposal would require a project level Environmental Impact Statement to analyze the site-specific proposal, alternatives and environmental consequences.

Activities related to locatable minerals are classified as prospecting, exploration, development, and production. These activities have different levels of impact which are discussed below:

a. Prospecting

Prospecting involves the general surveying of an area to determine the possibility or probability that a valuable mineral deposit exists. Activities include the examination of rock outcrops, collection of geochemical data, such as stream sediment samples, and geophysical data, such as gravity or aeromagnetic surveys. If deposits are known to exist in the area, prospecting could include preliminary exploration to test values and extent of these deposits.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Impacts to the ground and other resources from prospecting would be extremely light or nonexistent. There would be no detrimental effect to the land's productivity. However, without prospecting, the underlying minerals could not be utilized. It is a necessary step to enhance mineral development. It is the actual development activities that could create significant environmental effects.

Irreversible and Irretrievable Commitment of Resources

None identified.

Conflicts with the Objectives of Other Land Management Plans, Policies and Controls

None identified.

Adverse Effects Which Cannot be Avoided

Wildlife may be displaced by human activity in certain areas. This is not considered a significant effect.

Energy Requirements

Energy would be expended by prospector traveling to the areas and transporting equipment. No projection of energy consumption is made.

b. Exploration

Exploration involves the search for a valuable mineral deposit after prospecting has identified an area with a high probability for containing such a deposit. Activities could include (1) detailed surface geological mapping; (2) bore holes or test pits to obtain samples; or (3) surface or underground workings.

Surface impacts vary depending on the method being used and the size of the area being

explored. Exploration is an extension of prospecting activities, but the area of interest is usually smaller concentrating the impacts. Generally, scattered minor surface impacts may occur during initial exploration activities because the target area is not yet clearly defined. Later activities may include closely spaced drilling programs requiring some road construction, drill site leveling, or open excavation to expose bedrock.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Continued activity could result in an increased number of roads and disturbed areas on the Forest. This will reduce the Forest's nonmotorized recreation resource but increase motorized access. Effective transportation planning can minimize the number and miles of road necessary to provide adequate access. These roads may also benefit the management of other Forest resources in the area such as marginally commercial timber.

Soil productivity would be affected at local sites where drilling or digging takes place. Erosion could occur if the exploration site is not properly designed and maintained. Vegetative regrowth could also be hampered by the disturbance of exploration activities.

Irreversible and Irretrievable Commitment of Resources

Due to the surface disturbing activities, some areas may not be able to be reclaimed to a condition where the imprint of man's activity is not noticeable which would decrease the quality of the visual resource.

Adverse Effects Which Cannot be Avoided

Surface disturbing activities could adversely affect water quality and fisheries habitat through increased sediment production. This could be minimized by limiting the size of the area disturbed and promptly rehabilitating the area to control any erosion and surface water runoff.

Exploration could cause disruption to wildlife due to the increased human presence in the area. Seasonal restrictions on activities would reduce this effect during critical time periods for wildlife.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

Some major conflicts could arise during the developmental activities to extract the mineral resource, but exploration would result in lesser conflicts such as temporary displacement wildlife and vegetative destruction.

Energy Requirements

Energy requirements vary with the method of exploration being used. If a detailed drilling program is used, the energy requirements could be fairly high for truck-mounted drills. Other activities would have energy requirements no greater than prospecting. No projection of energy consumption is made. A limited amount of energy would also be used by the Forest Service to monitor and administer these activities, but an insignificant portion of the Forest total.

c. Development

Development is the preparation of a valuable mineral deposit for actual mining and mineral production. Development causes the greatest intensity of surface disturbance; however, the working area is fairly well defined and generally limited to the area of future operations. Activities would include additional ore body delineation as well as development of the actual operations site; construction of ore bins, tailings ponds, dump areas for mine waste, and upgrading access roads if needed.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The development of roads to provide necessary access will decrease the opportunity for nonmotorized recreation but may increase the opportunity for motorized recreation. The additional roads may be closed to general public use and reclaimed upon completion of the project, thus limiting any further degradation of soil, water or vegetative resources. They may also be retained and be available for the management of other Forest resources, thus providing an opportunity for timber, range or wildlife habitat management previously unavailable. Depending upon the project's plan of operation, the roads could be beneficial or detrimental to the land's long-term productivity. It is necessary to realize that the mineral ore could not be mined and utilized by the public without the access roads.

Irreversible and Irretrievable Commitment of Resources

The removal of mineral resources is an irreversible and irretrievable commitment of the mineral resource. The scar of mining on the landscape is usually irreversible and irretrievable, although reclamation can soften the detrimental impacts.

Adverse Impacts Which Cannot be Avoided

The surface disturbing activities may have an adverse effect on water quality and fisheries habitat. These impacts can be reduced by careful design and location of facilities or activities to minimize the amount of erosion and surface water runoff.

Development activities may displace wildlife due to the continual human presence in the area. This can be minimized by restricting the area of activity during any critical time periods for wildlife.

Air quality may be affected by the surface disturbing activities. The removal of vegetation would create the potential for dust, and the use of moto-

rized equipment would involve exhaust emissions. These effects can be minimized by the use of dust abatement practices and proper maintenance of exhaust systems on the equipment used.

Depending on the type of mining operation, equipment noise and truck traffic can disrupt an otherwise quiet environment. Visual impacts, while usually localized, can be extreme and unacceptable.

Development can affect the social and economic structure of local communities due to increased jobs and a possible influx of people which could put a strain on local resources. Mitigation is possible through community planning as soon as the probable size of the development is known.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

The possibility of conflict would be analyzed at the time of project environmental analysis.

Energy Requirements

Energy would be used to operate equipment used to prepare the ore deposit for production as well as to construct the mine site and associated facilities. Energy would also be used by the Forest Service in the monitoring and administration of these activities, but a minor portion of the Forest total. No projection of energy consumption is made.

d. Production

Production involves mining and transporting ore from the mine to the mill or market. Little additional surface disturbance beyond that done during the development phase will normally occur except within the mining operation area, or in the case of on-site concentration, from mill tailings. To maintain ore reserves, limited surface drilling may continue to define new extensions of the ore body.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The existence and use of the production facilities and associated surface disturbance will affect the visual resource of the area. These effects can be minimized by screening where possible, using earthtone colors, and considering the visual resource while planning and locating facilities.

Irreversible and Irretrievable Commitment of Resources

The removal of mineral resources is an irreversible and irretrievable commitment of the resource. The scar of mining on the landscape is usually irreversible and irretrievable, although reclamation can soften the detrimental impacts.

Adverse Effects Which Cannot be Avoided

Water quality may be affected due to the continued area of surface disturbance and the disposal of mine waste material. If there is on-site concentration, there is the potential for seepage or loss of fluids from the mill tailing ponds. Fisheries habitat could also be affected due to increased sediment production and possible increased chemical or heavy metal contamination. These effects can be minimized by proper location of facilities, implementing erosion control measures, and continual monitoring of tailings ponds and surrounding areas.

Air quality may be affected by dust and exhaust emissions generated by large volumes of traffic to and from the area as well as by equipment used on the site. These effects can be reduced through the use of dust abatement and proper maintenance of exhaust systems on vehicles and equipment.

Wildlife may be displaced from the area due to the constant human presence and the noise generated by equipment being used. This effect would be difficult to mitigate but could be lessened by locating facilities outside of primary habitat and reducing the noise levels as much as possible.

Production could affect the social and economic structure of local communities due to the jobs created by the activity and possible influx of people into the area. Production could provide economic growth to the area but could also strain community resources and facilities. These effects can be mitigated somewhat through community planning.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

Specific conflicts with other resource needs would be identified in project EIS's.

Energy Requirements

Fairly large amounts of energy may be necessary to produce and transport the mineral resource as well as to transport workers to and from the mine site. If the mining claims are not patented, the Forest Service would use energy in the monitoring and administration of the mine operating plan. Rehabilitation of the area when the mine is depleted would also require the use of energy resources. No projection of energy consumption is made.

3. Coal

The Custer National Forest is underlain with an abundance of coal. As explained in Chapter III, the coal under Custer National Forest lands is not available for development by surface mining at this time (Surface Mining Control and Reclamation Act of 1977). A "coal unsuitability" study was conducted for lands in the Little Missouri National Grasslands. The study identified 63,147 acres of lands available for further study of surface mining for coal within 200 feet of the surface. Further study is not scheduled at this time, but the U.S. Forest Service would participate in a cooperative

study with the Bureau of Land Management whenever deemed necessary. Therefore, there are no direct impacts of coal mining on the Forest at this time. The potential for coal development and environmental consequences is not projected in the alternatives.

Montco Coal Company is proposing a surface coal mine adjacent to the Ashland District in southeastern Montana which would abut the Tongue River Breaks Hiking and Riding Area. A project EIS was prepared for this proposal and was filed July 9, 1984. There are several mining operations near the Forest that have created indirect effects such as increased hiking, hunting, camping and fishing.

4. Common Variety Minerals

Common variety minerals on the Forest include sand, gravel, and porcellanite (scoria). Sand occurs Forest-wide. Gravel is found on all Districts except the Sheyenne Ranger District in eastern North Dakota. Porcellanite occurs on the Sioux, Ashland, Medora, and McKenzie Ranger Districts only.

The extraction of commmon variety minerals on the Forest is almost entirely for non-commercial use or is used on the Forest for road surfacing. Under the alternatives that emphasize non-commodity values, the extraction of these minerals would be limited to a few select sites and reclamation would be required. Under the alternatives that emphasize commodity production, these minerals would be made more readily available, although production levels of these common variety minerals are not projected in the alternatives.

The Forest currently has 12 active common variety permits that allow extraction of these resources for noncommercial use. Most of these permits are held by counties.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The vegetation on the pit sites would be destroyed. The pits would be reshaped and rehabilitated when depleted or no longer needed. The long-term productivity on the site after rehabilitation may be reduced.

Irreversible and Irretrievable Commitment of Resources

The removal of sand, gravel or porcellanite is an irreversible and irretrievable commitment of the resource.

Adverse Effects Which Cannot be Avoided

The visual setting will be impacted while the pit is operating. Air quality may be also reduced from dust. A road surfaced with this material, however, requires less maintenance and enables all-weather travel.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

The removal of the surface vegetation would have to be coordinated with the affected Allotment Management Plan to determine the effect if any to livestock grazing and wildlife habitat.

Energy Requirements

Energy would be expended by the Forest in monitoring common variety permits as well as the energy needed by equipment to extract the material. Transporting the road surfacing material to the construction site also requires energy. Locating the source as close to the construction as possible would reduce this need, but no projections of energy consumption are made.

V. Livestock Grazing

The Forest currently supports 875,000 Animal Unit Months (AUMs, see Glossary for definition) of livestock grazing each year. The volume is established by the trend condition and carrying capacity of the Forest's rangelands and grazeable timberlands. The actual use is usually somewhat less due to individual ranching operations, livestock market or weather. The alternatives analyze various strategies for management of the range resources which produce varying amounts of potentially available forage (shown in AUMs) for livestock grazing. Factors that affect forage productivity are soil fertility, type of grazing system, amount of planned grazing (permitted livestock numbers), length of use season, and structural or nonstructural improvements available or planned. This potential production by alternative and decade is shown in Table IV-25. The environmental consequences of livestock grazing, structural, and nonstructural improvements are discussed in following sections.

Grazing is a long accepted use of the Forest and approximately 763 livestock producers are dependent to some degree upon grazing the National Forest System lands for their livelihood. There are 1,628,720 acres suitable for range management on the Forest. The economic and social benefits of the grazing on the Forest are of great importance to the lifestyle of the livestock producers.

All alternatives provide for some level of livestock grazing. Alternatives 2 (RPA), 7, 7a, and 7b have the highest overall levels of grazing. Alternatives 1 and 8 have the lowest levels of livestock grazing. The rest of the alternatives vary between these two extremes, depending upon the objective of the alternative. Grazing is an important contributor to the economy of the Forest's zone of influence.

TABLE IV-25
POTENTIAL LIVESTOCK FORAGE
(M AUM's)

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Potential range forage	M AUM		1980 Base = 875 M AUMS																
Decade 1	827	902	887	887	896	896	896	896	894	899	900	906	906	916	878	893	865	884	0
Decade 3	704	954	881	881	902	902	902	902	896	916	917	957	957	957	813	896	858	880	0
Decade 5	728	973	898	898	920	919	919	919	913	933	934	977	975	975	833	914	875	899	0
Decade 7	721	973	899	899	920	920	920	920	913	934	935	977	976	976	833	917	875	898	0

1. Grazing Effects

Allowing livestock grazing has an effect on the socio/economic and environmental resources. The intensity of grazing, both in animal numbers and length of grazing season, proportionally magnifies or diminishes the degree of impact. The emphasis within this section will explain the impacts of livestock grazing.

Livestock grazing impacts of particular concern include deterioration of range condition and reduction of wildlife habitat. Grazing Allotment Managment Plans (AMP's) which are site-specific planning documents (see Glossary) implement Forest Service policy and Forest Management Plan direction. They require analysis that addresses not only the livestock management, but the whole array of resources associated with range management, such as the habitat needs of key wildlife species. Woody draws and riparian areas are areas of special concern, and their management is considered all AMP's. The deterioration of vegetative conditions and wildlife habitat are usually brought about by improper stocking levels, grazing prior to range readiness, and livestock distribution. AMP's usually incorporate rotation grazing in conjunction with range improvements to manage the allotment in a proper way to avoid adverse impacts on any resource, or mitigate detrimental grazing impacts.

The deterioration of the forage base is the displacement of key forage-producing native grasses and forbs with less desirable plants, which reduce the productivity and carrying capacity of the range. If no preventative or corrective actions are taken, forage diminishes, and eventually stocking will be reduced to protect the basic soil and water resource. This can create a significant adverse impact to the livestock producers.

Deferred and rest rotation grazing provide protection for key forage species through all or portion of the entire grazing season during alternate years. Structural range improvements primarily facilitate better livestock distribution, while nonstructural improvements are designed to rapidly improve forage productivity, or to protect the soil of the area (See Sections 2, Structural Range Improvement, and 3, Nonstructural Range Improvements, that follow for details).

Range practices are designed to allow each vegetative habitat type to progress to a composition that is the most productive for the site. The first priority for the resultant forage is soil protection and soil productivity. Current levels of livestock grazing and protection and enhancement of key wildlife habitat are expected to be maintained. The last use of excess forage would be to increase livestock grazing.

Woody draws, riparian vegetation complexes, and draws where surface and subsurface water concentration occurs are especially sensitive areas to livestock grazing. These areas are sought out by livestock because they provide succulent forage for a longer duration during the summer and early fall. They also provide shade and in some cases drinking water. These areas are usually easily accessed by cattle.

Livestock use in the woody draws and riparian and wet areas result in soil compaction, heavy utilization of understory vegetation, and direct physical damage to limbs and trampling of reproduction of shrubs and trees. If there are running streams within these areas, concentrations of livestock can cause the breaking down of streambanks, increase sedimentation, and increase nutrient levels which results in a reduction of dissolved oxygen.

Grazing systems, deferred and rest rotation of pastures, provide relief from livestock for portions or all of some years. Structural range improvements, particularly water developments, are intended to distribute livestock away from riparian areas and woody draws. However, implementing such grazing methods may encourage livestock to graze within adjacent hardwood draws or riparian zones which previously have received very little use. For example, within the Little Missouri National Grasslands, many woody draws occur well away from primary use drainages. By implementing rotation grazing, livestock can be "forced" into these new areas by fencing. In effect, the use has been shifted, rather than eliminated. To mitigate these possible adverse effects, a monitoring plan is prescribed in each Allotment Management Plan, addressing key areas and problems that are unique to the allotment.

Key winter ranges are areas used by big game during late fall, winter, and early spring. These areas are often essential for their survival. Developing water improvements in conjunction with rotating livestock grazing can reduce livestock utilization of forage within these winter ranges, insuring enough forage for big game. On the other hand, implementing new rotation management may force livestock to utilize winter range areas not previously grazed. Consequently less forage could be available for big game in these other areas. Fencing may be used to exclude livestock from riparian, woody draws, and big game winter range. Key wildlife habitat areas are identified as part of the field work done in preparing an Allotment Management Plan, and the grazing system is then designed to protect these areas.

Important upland bird n ting habitat is predominately associated with g sland benches, ridges, and plateaus, which in most cases is secondary livestock range (see Glossary). When this secondary range is utilized by livestock, less residual cover will be available for prairie grouse and nongame birds. Contrary, the same management practices may reduce grazing pressure within hardwood draws, which serve as important fall and winter habitat for prairie grouse.

Threatened or endangered animal species that may inhabit livestock grazing areas, such as the grizzly bear, and black-footed ferret, would be afforded protection. Other threatened and endangered species possibly found on the Custer National Forest, the interior least tern, piping plover and bald eagle, would most likely not be affected by a livestock grazing, due to their association with river bottoms and large bodies of water. There are not any Federally listed threatened or endangered plant species on the Custer National Forest, however, the plants included in state lists and in a Category 2 status of the Federal list would be afforded some degree of protection through the Allotment Management Plan process.

Livestock grazing may annoy some forest users because of smells, flies, visibility, noise, and manure on trails and around campsites. Most of these conflicts will be in meadows and grasslands near level terrain and slow moving streams.

Grazing of National Forests and National Grasslands is a long-standing tradition. Most of these areas were grazed as open range before the Forest Service was established. Most ranchers and livestock growers have been in the business for many years and are very aware of the problems that result if poor land management practices are used. Most land uses within the boundaries of the Custer National Forest have been common for close to fifty years. Most permittees on the lands administered by the Custer National Forest are at least partially dependent on this land base to round out their operations. Changes in the economic situation and other demands on the limited land base directly and indirectly affect their lifestyle and livelihood.

The economic contribution of grazing on the National Forest system lands is signficant in many smaller communities. The National Grasslands in North Dakota are significant contributors to the Nation's demand for beef. These same lands are also important to recreationists of the state.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

The activity of livestock grazing is needed to some extent to enhance the long-term productivity of the rangelands. The land has always been grazed by some type animal, either wild (such as bison) or domestic. Overgrazing can occur and be detrimental to the long-term productivity.

Irreversible and Irretrievable Commitment of Resources

Once forage is consumed, it is not retrievable (other than in human consumption of meat), but the decision to allow grazing can be reversed. As noted earlier, grazing has been a traditional use on the lands of the Custer National Forest for many years. The 10-year grazing permits issued by the Forest commit the forage for this period of time. It would be highly unlikely that elimination of livestock grazing on the Custer National Forest would be considered.

Adverse Effects Which Cannot be Avoided

Localized sites across the Forest will undoubtedly suffer overgrazing, soil compaction and erosion, lessened water quality or lessened wildlife habitat. Some degree of these effects are unavoidable because of the wide-ranging influence of livestock grazing. Significant adverse effects are less probable because of management policies and permittee concern for continued grazing.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

As discussed previously, livestock grazing can be in conflict with other resources such as big game winter range, upland bird nesting habitat and recreation opportunity.

Energy Requirements

The range program is the largest of all Forest programs. Energy requirements for administration and analyses are significantly lower than other activities such as timber harvest or oil and gas development. Table IV-26 shows the energy requirement for range management:

2. Structural Range Improvements

Structural range improvements include fences, wells, spring developments, pipelines, and wind-

TABLE IV-26
ENERGY CONSUMPTION FOR RANGE MANAGEMENT

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Grazing Management (Gallons of gasoline)																			
Decade 1	827	902	887	887	896	896	896	896	894	899	900	906	906	916	878	893	865	884	0
Decade 3	704	954	881	881	902	902	902	902	896	916	917	957	957	957	813	896	858	880	0
Decade 5	728	973	898	898	920	919	919	919	913	933	934	977	975	975	833	914	875	899	0
Decade 7	721	973	899	899	920	920	920	920	913	934	935	977	976	976	833	917	875	898	0

mills. The purpose in constructing these improvements is to facilitate better livestock distribution, defer key forage, mitigate other resource conflicts, and increase or sustain livestock production. The level of improvements varies among the alternatives by the objective of the alternative and the amount of land designated for intensive range managment. Alternatives 2, 3, 7, 7a and 7b would require significant structural improvements to attain the sustained high level of forage production as shown in Table IV-25, Potential Livestock Forage. See Table II-23, Major Data Table, under the items Range Costs, Range Costs (RBF-Range Betterment Funds) and Range Costs (CP-Conservation Practices) to identify the level of investment needed for each alternative.

Table IV-27 displays the current inventory of structural range improvements on the Forest:

TABLE IV-27
STRUCTURAL RANGE IMPROVEMENTS

Cabin		1	
Barn		1	
Corral		107	
Cattleguards		118	
Spring:	Wood Tank	675	
	Metal Tank	42	
	Concrete Tank	3	
	Plastic Tank	84	
Artesian Well		82	
Well:	Windmill	276	
	Pump	208	
	Unequipped	12	
Trick Tank		14	
Pit Tank		512	
Dam/Reservoir/Stock Pond		961	
Other Water Developments		525	
Pipeline, Water Transmission		438.28	miles
Ditch, Water Transmission		2.48	miles
Fence:	NF Boundary	550.7	miles
	Allotment Boundary	1,702.07	miles
	Internal	863.98	miles
	Water Source	19.64	miles
	Rights-of-Way	17.75	miles
Stock Trail		1.04	miles

Fences are usually constructed around and within allotments to separate and divide allotments into pastures. In general, more intensive range management systems require more fences. An intensively-managed allotment, such as one using a rest rotation system or a high intensity short duration grazing method may divide the allotment into four to sixteen pastures, requiring considerably more fence. Fencing may also be used to limit livestock use within sensitive areas, such as riparian areas, woody draws, high use recreation sites, and other special areas. Improperly designed or constructed fences can be a barrier to wildlife movement. To avoid this, fence are designed to permit easy crossing by wildlife.- Therefore, the effects of fencing are increased as more intensive management is implemented. This increased intensity is directly proportional to the potential forage production.

Range water improvements are developed to improve livestock distribution, and secondarily to provide water for other users such as wildlife and recreationists. There are few conflicts with other resources. Initial construction of pipelines and water tanks disturbs soil and vegetation. Pipelines usually recover vegetative production in one growing season. Soil conditions around water tanks, reservoirs or ponds usually deteriorate from trampling to the point of non-production.

Structural developments change cattle use patterns and encourage use on areas previously unused. This often changes the use patterns for wildlife as cattle are moved into previously unused areas. See discussion above in Section 1, General Effects for more discussion.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Structural range improvements can distribute livestock grazing into previously ungrazed areas, enhancing long-term livestock production. This could, however, result in conflicts with other resources, such as grouse nesting areas and recreation use areas. Structural improvements require a short-term investment of time and money for construction and maintenance. However, these developments are essential in maintaining the long-term productivity of the National Forest System lands if the present number of permitted livestock are to be maintained.

Irreversible and Irretrievable Commitment of Resources

Constructing and maintaining structural improvements tend to commit the land to a grazing program due to the size of the investments. Although the improvements can be abandoned, it is unlikely that this decision would be made. Additionally, structural range improvements, such as water tanks and reservoirs, physically remove

those areas from vegetative production, but is considered a minor irretrievable loss.

Adverse Effects Which Cannot be Avoided

Construction of structural improvements can cause short-term soil erosion. However, natural revegetation usually occurs within one growing season. Visual resources will be affected by the installation of these facilities. This may not be unacceptable as the historic character of the landscape included some level of alteration associated with livestock management, such as fences and windmills.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

Fencing can conflict with wildlife movement, particularly antelope. Fences can be designed and constructed to minimize this danger.

Energy Required

Considerable energy may be expended in the construction of structural range improvements, since heavy equipment is often used. Additional energy will be used by the livestock producers when maintaining improvements and by the Forest in administration of the improvements. See Table IV-26 for total energy requirements for the range program.

3. Nonstructural Range Improvements

Nonstructural range improvements are practices implemented on the land to improve or facilitate range management. They include activities such as conifer and sagebrush encroachment control, ripping and interseeding, burning, fertilizing and noxious weed control. These activities are designed primarily to enhance vegetative production and composition and to reduce the overland flow of water. These practices tend to be associated with fairly intensive management strategies, however, noxious weed treatment would occur regardless of the grazing strategy within an allotment. Alternatives 2,3,7,7a and 7b would require significant nonstructural improvements to attain the sustained high level of forage production as shown in Table IV-25, Potential Livestock Forage. See Table II-21, Major Data Table, under the items Range Costs, Range Costs (RBF-Range Betterment Funds) and Range Costs (CP-Conservation Practices) to identify the level of investment needed for each alternative.

Conifers, sagebrush, and other undesirable woody vegetation are usually removed by spraying, burning, or mechanical means. Spraying is a very effective method, but there is a risk to non-target species. Any spray proposal would require a site-specific and health risk analysis. Burning not only removes the trees and brush, but returns nutrients to the soil, further enhancing forage production. Mechanical means, grubbing, disking or mowing, can affect some non-target species, but is very effective in stimulating mature, rank grasses in low-lying wet areas.

Pine encroachment into historic rangelands is indicative of the lack of periodic natural fires that would destroyed the trees. (Range fires has been successfully suppressed for many years, interrupting a natural patterns.) To not control the encroachment would result in reduced forage production, lessened edge-effect for wildlife security and a general unnatural changeover of vegetaive types. Treatment includes burning, mowing or cutting down. In some cases, Christmas tree harvesting might be appropriate. There are little estimated detrimental effects of pine tree encroachment treatment. This situation exists primarily on the three National Forest Ranger Districts, Beartooth, Ashland and Sioux.

Similarly, a number of different species of sagebrush can affect rangeland productivity and in some cases, treatment is necessary to preserve productivity. Removing sagebrush can alter the habitat for those wildlife species using this vegetation, such as antelope and sage grouse. Because of the public sensitivitiy of sagebrush habitats, an analysis in greater detail would be required before a treatment would be implemented. The Forest Service lands in North Dakota have limited sagebrush habitat, important to deer and antelope, while in Montana and South Dakota the sagebrush habitat is more abundant and could possible undergo treatment to enhance forage production. In either case, a thorough environmental analysis, including an evaluation of any possible threatened and endangered species habitat or key Forest species would be made prior to implementation.

Tree and brush control can make an area more attractive to those wildlife species adapted to open grassland, e.g., make available more forage on key big game winter range.

Ripping is method of pulling a ripper tooth (a farm implement) through the soil at a depth of 18-24" with a tractor. This narrow blade creates open pockets in compacted soil for rain water retention and aeration. It additionally stimulates forage production. Interseeding, either by braodcast or drill seeder pulled by a tractor, is used to introduce a new species or reintroduce an old species into the stand. Both practices along with fertilization are designed to improve stand composition and increase forage production and are throughout the Forest under an intensive range management strategy.

Using managed fire on rangelands helps to reintroduce a historic pattern of range fires, which played an important role in range rejuvenation and eliminate of undesirable plant species. This method is currently used primarily on the Sheyenne Ranger District in low-lying wet areas

where forage can overgrow, turn rank and become unpalatable to livestock. Under the Preferred Alternative, about 500 acres would be burned annually on this District. Other alternatives would vary depending upon the amount of acres intensively managed for forage production. Some beneficial non-target plants could be damaged during a fire, but most likely not permanently. A survey for any Category 2 plants (under consideration for threatened or endangered classification) or sensitive species would be made prior to any treatment.

Noxious weeds are treated through an integrated pest management strategy, featuring herbicide application, mechanical treatments and biological control agents as they become available. State laws require all landowners to control noxious weeds. Several weeds, including leafy spurge, are difficult to kill. The largest infestations currently occurs on the Sheyenne Ranger District (eastern North Dakota) and Medora Ranger District (western North Dakota) where leafy spurge is widespread and difficult to treat effectively. Noxious weeds alter natural vegetative composition and reduce range and wildlife habitat capacities. Biological control is the preferred method of controlling noxious weeds. Sufficient supplies of biocontrol agents have not been developed. The Custer National Forest completed an environmental impact statement for the noxious weed control program in May 1986. It is incorporated by this reference into this EIS. For further details of the environmental analysis, the selected treatment program, mitigation measures and health risk analysis, see the Noxious Weed Treatment EIS available upon request or at any Custer National Forest office.

In most cases, ripping, interseeding, fertilization and burning would create more favorable wildlife habitat and watershed conditions, because the forage production would be increased substantially, providing more residual cover for bird nesting and water retention. Some soil compaction or surface erosion could occur during fertilzation by the large equipment used, but this would be short-term and a minor consequence.

Any of these practices have the potential to negatively or beneficially affect other resources. The most sensitive resource is estimated to be wildlife habitat, and in turn the animals themselves.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity

Short duration impacts include soil compaction with control equipment, temporary loss of non-target plant species, and possible opportunity costs for the livestock producers. Short-term lost would include temporary livestock exclusion or reductions for up to three years to favor the improvement practices. Livestock producers may also have to spend additional time and money for improvement implementation. However, the short-term impacts are minor when compared to long-term production gains derived from nonstructural improvement practices.

Irreversible and Irretrievable Commitment of Resources

The implementation of nonstructural improvements tends to make an irreversible commitment of the range for to some sort of utilization, either soil and water protection, livestock grazing or wildlife habitat. It is an irretrievable commitment of the range resource in the sense that once the nonstructural practice is implemented the forage burned or the pine tree cut is lost, although it may be replaced by natural reproduction over time. The fertilizer used on the range grass is also irretrievable.

Adverse Effects Which Cannot be Avoided

Burning may temporarily destroy some desirable plant species or wildlife habitat. Furrowing, interseeding, and other mechanical methods also remove or affect some non-targeted plants. nonstructural management practices also alter the appearance of the landscape for a few years. The impacts of burning are usually gone within a grazing season, but the impacts of treating brush or tree encroachment may be visible for many years. nonstructural improvements, primarily periodic prescribed durning, contributed only secondarily to oil development in the accumulation of acres in a disturbed condtion.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

Extreme care must be taken in determining the appropriate nonstructural improvement method for any given allotment. Wildlife habitat and sensitive plant protection must be assured before implementation. This site-specific analysis is made in the Allotment Management Plan process.

Energy Requirements

Considerable energy may be expended with nonstructural improvements. Additional energy will be consumed by the livestock producers when maintaining treated acres and the Forest will use more energy in administration. The total consumption of energy for the range program is shown in Table IV-24.

W. Road System

Road construction and maintenance have a greater effect on other resources than any other Forest management activity. The primary effects are the displacement of large amounts of soil, increased vehicle access (with associated loss of roadless resource), and greater visual impacts. Most of the existing effects of road construction

have been in the Little Missouri National Grasslands (western North Dakota)and are associated with oil and gas development.

Between four and eight acres of land are affected between the top of the cut and the bottom of the fill slope for every mile of road built. No vegetation will grow on the road surface, but some will grow on some portions of the cut and fill slopes. There may be a slight reduction in productivity along the sides of roads across steep slopes (Pfister and others, 1977). Road rights-of-way have been difficult to revegetate in the Grasslands due to lack of topsoil and the difficulties in restricting livestock movement on the rights-of-way. Livestock prefers the new vegetation in the rights-of-way, limiting seed production.

Anticipated and existing road statistics are shown in Table IV-28. Only the mileage of arterial and collector roads were projected because general assumptions could be made regarding reasonable routes and areas of high resource development potential, primarily oil and gas and timber. In both cases (oil development or timber harvest), further environmental analysis will occur at project level within the scope of this EIS to determine the amount of local or temporary roads. Only these arterial and collector roads are displayed.

Alternatives 7 and 7a, which emphasize commodity production, requires the greatest amount of road construction. It is these roads that access the timber and oil and gas resources necessary to meet the objective of these alternatives.

There will be additional local and/or temporary roads built oil and gas development and timber harvest. It is not feasible within the scope of Forest Planning to estimate or project the mileage of local and/or temporary roads needed for oil and gas development because of the uncertainty of specific project location. Local conditions significantly affect the amount of road required and the degree of impact from such roads. Roads built for timber hauling can also facilitate exploration and development of locatable and leasable minerals and vice versa.

The world oil market play a significant role in the amount of domestic oil production and this market is often very volatile. To pre-determine the location of a well within the one-half or one-quarter section of land was simply not feasible. Road construction for oil and gas development is related directly to the amount of land leased and available for development. It was assumed at the beginning of the planning process that all of the Custer National Forest held some level of potential production except the Sheyenne National Grasslands (North Dakota), Pryor Mountains (Montana) and the Absaroka-Beartooth Wilderness (Montana). (See discussion in Section U, Minerals, of this chapter for details regarding oil production potential.) Table IV-29 shows the required miles necessary for each alternative's projected oil production. The alternatives that emphasize market goods require the greatest mileage, Alternatives 2, 3, 7a and 7b.

The local or temporary road for timber harvest is likewise difficult to estimate because many of the logging system details are not known until the sale area is field-examined. Road construction for timber harvest is directly proportional to the size of the timber sale program in the long-term. Many roads constructed for timber harvest are closed after the timber is removed and the logging slash disposed . These roads may not obliterated if they

TABLE IV-28

PROJECTED ROAD CONSTRUCTION

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Roads needed for management			Miles			1980 Base = 3803 Miles													
	4447	5685	5685	4448	5098	5295	5273	5285	5203	5664	5628	5685	5678	5639	4400	5660	5650	5685	3803

TABLE IV-29

MILES OF ROAD NEEDED FOR OIL DEVELOPMENT BY ALTERNATIVE

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Road Construction Oil and Gas			Miles																
Decade 1	25.8	75.2	75.2	25.8	51.8	59.8	58.8	59.4	74.4	74.4	73.0	75.2	75.0	73.4	53.8	74.4	73.8	75.2	25.8
Decade 3	6.2	18.4	18.4	6.2	12.8	12.8	14.6	12.8	18.2	18.2	18.0	18.4	18.4	18.0	12.6	18.2	18.0	18.4	6.2

are needed for future timber harvest or other resource management needs. Table IV-30 shows the miles of arterial and collector roads needed for timber management:

Alternatives 6a, 6b, 7, 7a, and 8 (Current Management) have the most road construction for timber harvest. Alternatives 5a, 6, and 9 (Departure From Alternative 6), have the smallest road construction programs for timber harvest.

Roads provide access for increased motorized recreation, but eliminate primitive recreation opportunities and reduce non-motorized recreation opportunities. Recreationists will either shift their use to another roadless area or continue to use the same area and realize a change in their recreation experience. People preferring roaded recreation will find greater opportunity to access Forest lands in an alternative with significant additional roads.

Road construction can affect the basic character of the landscape by changing its integral factors: form, color, texture, or line. Roads across open areas on steep slopes are highly visible for many miles. Cuts and fills are often visible for great distances. Where the visual resource is important, the visual effect can be reduced by design and mitigation measures such as route selection to minimize earth work, leaving vegetative screens, seeding disturbed areas, designing and rehabilitating cut and fill slopes.

Road construction can disrupt or destroy cultural resources. See the coordination requirements in Section G, Cultural Resources, of this chapter.

Roads often cross game trails and change animal movement patterns. Cover is destroyed and the security of an area is reduced by increased road access. Road construction has had a major effect on the wildlife movement patterns and has opened up areas for road hunting in the Grasslands. The average road density per mile in the highly developed oil and gas field is about 2.5 miles of road per square mile. These roads are often used 24 hours per day, 7 days a week, during drilling operations and for a short time thereafter until the well is regulated and tied into a pipeline. Narrow roads built to follow the terrain with minimum cuts and fills reduce these impacts. Road closures can restore the security of big game animals to acceptable levels, even though the road provides a travelway for horseback riders, hunters and hikers.

Roads in riparian areas can cause significant sediment to be delivered to streams. This adversely affects fisheries by smothering eggs, fry, and food organisms. Fry and fingerlings lose hiding cover and are more vulnerable to predators. Water quality is affected by road building to the greatest degree of any Forest activity (Rice, 1981; Megahan 1975 and 1976). The Forest Management Plan details specific requirements for road building in these areas.

Roads built into roadless areas eliminates a portion of the roadless resource. Significant comment was voiced during the public review period on the Draft EIS regarding the loss of roadless resource in North Dakota. As a result, the Preferred Alternative, Alternative 10 in the Final EIS designates more areas to roadless management, thus limiting the possibility of road construction in those areas.

Road management can mitigate or avoid potential conflicts between road construction use and other resource needs in the Forest. Seasonal or year-around road closures can be used to provide a wide variety of recreational opportunities, even though the environment is changed by the physical presence of the road. See Chapter II, Section 12, Road System, for a discussion of Forest road management. Road management philosophies do not vary among the alternative, but the number of miles managed in a certain way would.

Short-term Use vs. Maintenance and Enhancement of Long-term Productivity Roads are vital support facilities to the numerous resource management activities on the Custer National Forest. The oil/gas and timber resources could not be made available for public consumption without the access roads. Livestock care and transportation (stock carrying semi-truck trailers and feed delivery trucks) are beginning to depend more on a road system. Recreation opportunity is depend-

TABLE IV-30

MILES OF ROAD NEEDED FOR TIMBER HARVEST BY ALTERNATIVE

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Road construction timber (System Roads)					Miles														
Decade 1	5.3	3.3	6.6	5.1	6.1	10.1	10.1	10.1	6.0	12.6	10.1	9.0	9.0	9.0	6.0	4.7	4.5	.0	.0
Decade 3	2.6	5.0	6.8	5.3	5.3	5.1	5.3	5.3	3.0	6.3	5.4	6.5	5.3	4.7	2.4	6.0	2.3	13.0	.0
Decade 5	1.8	4.4	4.6	3.8	3.5	5.1	3.5	3.5	2.0	4.2	3.6	5.6	4.8	5.0	1.6	3.3	1.5	8.0	.0
Decade 7	1.8	4.0	3.0	2.5	3.5	5.1	3.5	3.5	2.0	4.2	3.6	3.7	3.2	3.3	1.6	2.1	1.5	2.8	.0
Road Construction Timber (local or non-system roads)					Miles														
Decade 1	1.0	.7	.7	.5	.8	1.1	1.1	1.1	.9	2.5	2.1	1.5	1.0	1.2	.9	.6	.5	.0	.0
Decade 3	1.4	2.9	1.7	1.5	2.3	2.5	2.5	2.7	1.7	2.9	2.2	3.3	2.6	2.3	1.0	1.5	.9	2.8	.0
Decade 5	.4	1.6	1.8	1.4	1.6	1.5	1.6	1.6	.6	1.3	1.0	1.7	1.4	1.5	.3	.9	.4	3.5	.0
Decade 7	.0	.6	.5	.7	.8	.2	.5	.7	.4	1.3	1.0	.6	.8	.8	.2	.6	.5	.9	.0

ent to some extent on the ability to get to an area by vehicle. Therefore, many resources' long-term productivity is dependent upon an appropriate road system.

However, designing and building a road system can have a long-term detrimental effect on the land's productivity. Even though efforts may be made to rehabilitate a road, the road bed itself and the cut and fill slopes will not produce as they did prior to the construction. This acreage is removed from the vegetative production capacity of the area.

Irreversible and Irretrievable Commitment of Resources

Road construction is an irreversible commitment of resources, since roads are essentially permanent features of the landscape. Many of the roads in the Grasslands will be rehabilitated to near original condition after oil and gas production has ceased. However, this is a loss of grass for grazing for 30-100 years. Roads remove the habitat for small animals and birds even though the edge of roads may create habitat for others. Roads change the type of recreation experience which can be enjoyed in the area. Actively traveled roads can have an adverse effect on the movement of big game animals. Roads can have severe long-lasting impact on the visual resource.

Adverse Effects Which Cannot Be Avoided

Roads alter the natural landscape, which cannot be avoided, but may be mitigated to the point of becoming visualy acceptable. Also unavoidable is the disruption of wildlife habitat and wildlife movement patterns. Roadless recreation opportunities are lost in the areas where roads are built. Wilderness potential in these areas is foregone. Road construction and maintenance cause the greatest amount of soil disturbance and erosion of any Forest management activity.

Conflicts With the Objectives of Other Land Management Plans, Policies and Controls

Before a road is built, the need for it and the effects are analyzed in a site- or project-specific analysis. Particularly sensitive resources are soil, water, visual and wildlife.

Energy Requirements

Road construction and maintenance require large amounts of energy use as shown in Table IV-31.

TABLE IV-31

ENERGY CONSUMPTION FOR ROAD CONSTRUCTION

	Alternative/Benchmark																		
	1	2	3	4	5	5a	5b	5c	6	6a	6b	7	7a	7b	8	9	PA 10	MAX PNV	MIN LVL
Road Construction (Thousands of gallons of diesel)																			
Decade 1	244	603	616	215	428	492	478	485	600	608	597	625	613	597	429	600	496	596	000
Decade 3	69	163	162	69	111	110	125	110	154	156	155	158	164	159	102	156	152	182	000
Decade 5	7	12	2	5	6	8	8	6	6	6	8	10	79	8	2	4	6	6	0
Decade 7	2	6	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	0

CHAPTER V
LIST OF PREPARERS

CHAPTER V
LIST OF PREPARERS

Forest Supervisor

David A. Filius

Preparation and implementation of Plan.
Appoint Planning Team Leader.
Appoint and supervise Interdisciplinary Team.

Forest Management Team

Dave Filius
John Inman
Leroy White
Norm Smyers
Dave Lee
Chuck McGlothlin
Wayne Smetanka
John Gibson
Mike Beckes
Carl Wolf

District Rangers

Bill Fortune
Phil Jaquith
Dave Aicher
Fred Dauber
Tom Heintz
Dick Farrar
Jim Fishburn

The Forest Management Team's overall role is to advise and assist the Forest Supervisor in the following:

Develop Forest mission statement.
Negotiate Forest's RPA target outputs.
Establish constraints set by completed land management unit plans.
Approve issues and management concerns and opportunities.
Recommend study plan.
Approve public involvement plan.
Approve planning criteria.
Approve alternatives.
Select proposed plan and recommend to Regional Forester.
Approve specific standards and guidelines.
Approve monitoring plan.
Implement plan. (Assign responsibility and accountability to District Rangers.)
Review plan and compare monitoring results.
Determine when to revise and/or amend plan.

Planning Staff Officer

Leroy White

Review for compliance with NFMA.
Coordination — other agencies, National Forests, Regional Office.
Recommend priority schedule.
Monitor time tables (realistic and met).
Link between ID Team and Forest Management Group.
Administrative support to ID team.
Public inquiries.

Core Interdisciplinary Team

Leroy White
Larry Potts
John Logan
Sue Zike
Barry Burkhardt
John Edwards
Lee McConnel

Develop study plan.
Develop planning criteria.
Identify issues and management concerns and opportunities.
Assess management situation (analysis).
Formulate alternatives.
Estimate effects of alternatives.
Evaluate alternatives.
Recommend preferred alternative.
Develop and recommend specific standards and guidelines.
Develop and recommend monitoring requirements.

Direct Support

Beverly Ramsey
Dixie Fletcher
Sue Harris
Ken Gehman
Claudette Clayton
Shelley McGlothlin
Lori Wilbur
Margaret Hicks
Mavis Love

Full- and part-time assignment to ID team for clerical (typing) and technical (mapping, graphing, data organization) assistance.

Support Team

Ted Reiger
Jim Pfau
Dean Bassett

Assist the Core Interdisciplinary Team in developing planning criteria, conducting information and data inventories. Assessing the management situation, formulating and estimating effects of alternatives, developing specific standards and guidelines, and developing specific monitoring plan. Many job assignments will be made on specific projects (steps within the planning process) as the need arises. Responsibilities and target dates will be established with each assignment.

Public Information Officer

John Gibson

Develop Public Involvement Plan.
Develop and maintain contacts with the public throughout the planning process and assist in analyzing comments received from the public (I&I Coordinator).
Conduct public involvement activities.

Persons Involved in Preparing the EIS

David P. Aicher
District Ranger; B.S. in Range Management.

Dean K. Bassett
Civil Engineering Technician; Associate Degree in Civil Engineering (North Dakota State School of Science).

Michael F. Beckes
Forest Archeologist; B.A., M.A., Ph.D. in Archeology/Anthropology.

William H. Blunt
East Zone Wildlife Biologist; B.S. in Wildlife Management.

Barry Burkhardt
Geologist; B.S. with geology major (University of North Dakota). One year experience as uranium exploration geologist. Five years of Forest Service experience on the Custer National Forest involving 3 years as District Geologist on District with heavy oil and gas workload, and 2 years experience as the Assistant Minerals Staff Officer.

Wilson F. Clark
Writer/Editor; Ph.D. in Conservation Education.

Claudette Clayton
Graphics Support.

Fredrick L. Dauber
District Ranger; B.S. in Agriculture.

John M. Edwards
Wildlife Biologist; B.S. and M.S. in Fish and Wildlife Management (Montana State University). One year St Regis (Montana) fisheries project; 2½ years baseline coal mining study Sarpy Creek (Montana), 1 year trapper for Interagency Grizzly Bear Study Team; 5 year Forest Service (R-1 and R-4) consisting of 3 years Boise National Forest Wildlife Biologist, and 2 years Custer National Forest Planning Team Wildlife Biologist.

Dave Filius
Forest Supervisor; B.S., M.F. in Forestry. 23 years professional experience with the Forest Service; 5 years as Forester, 2 years in Job Corps, 13 years as District Ranger, 3 years as Deputy Forest Supervisor, and 2 years as Forest Supervisor.

James R. Fishburn
District Ranger; B.S. in Forestry (Range Management). 22 years professional experience involving 4 years of range analysis and allotment management planning, 2 years watershed rehabilitation, 7 years timber sale preparation and administration, 6 years supervisory forester, range, recreation, minerals and Unit Plan planning team, and 6 years as District Ranger.

Richard T. Forsman
Supervisory Range Conservationist; B.S. in Wildlife Biology, Minor in Range Management.

Cary J. Frost
Supervisory Range Conservationist; B.S. in Range Management.

Ken Gehman
Illustrator.

John Gibson
Public Involvement Officer; B.S. in Forestry.

Curt Glasoe
Professional Engineer; B.S. in Agricultural Engineering, (North Dakota State University, Fargo).

Tom Heintz
Supervisory Range Conservationist; B.S. in Range Management and Botony.

John Inman
Deputy Forest Supervisor; B.S. in Forestry with Range option.

Phillip H. Jaquith
District Ranger; B.S., M.S. in Forestry.

Susan M. Zike Koch
Planner, Landscape Architect; B.S. in Landscape Architecture (Iowa State University). Seven years Forest Service experience consisting of 3 years in Region 9 as Landscape Architect involved in Land Management

Planning and field projects, 2 years as zone Landscape Architect for Custer and Lewis & Clark National Forest (R-1), involved in Lewis & Clark Forest planning and Dakota Planning Team for the Custer, and 2 years as Landscape Architect on Custer in planning and field projects; attended Recreation Shortcourse (Utah State University, 1980).

Dave Lee
Forest Engineer; B.S. in Engineering.

John R. Logan
Planner, Economist; B.S. in Range Management (Utah State University), M.S. in Range Ecology (Utah State University), M.S. in Resource Economics (Michigan State University). Six years with Utah State Division of Wildlife Resources consisting of 3 years Big Game Range Inventory and 3 years project leader for data base collection on portion of Central Utah Project. Four and one-half years with R-1 Forest Service involving 1 year Range trainee, 1½ years Resource Assistant, 1 year Education at Michigan State University, and 3 years Forest Plan team member.

James F. Mann
Forest Supervisor August 1981 to July 1984. B.S. degree in Range Management

Lee McConnel
Soil Scientist; B.S. in Forest Management, M.S. in Forest Soils (University of Idaho). Fifteen years of Federal Service with 10 years with the U.S. Forest Service and 5 years with Soil Conservation Service. Worked in timber sale preparation, soil and landtype inventory, woodland conservation, soil conservation, and as a Forest Soil-Watershed Specialist. Also provided Soil and/or Hydrologic data while on Forest Interdisciplinary Planning Teams for 7 years. Worked on five Forests in three Regions since first working as a summer temporary in 1960.

Charles E. McGlothlin
Forester; B.S. Range Management.

Jim Pfau
Highway Engineer; B.S. in Civil Engineering.

Todd Phillipe
Forester; B.S. in Forest Management (Iowa State University, 1971).

Larry Potts
Planner (Planning Assistant); B.S. in Range Management, University of Montana, 1971. Eleven years Forest Service experience on three Forests (R-3 and R-1), made up of 9 years experience in range management on three Ranger Districts and 2 years experience in Forest Land Management Planning. Participated in development of the Ashland Land Management Plan and EIS on Custer National Forest in 1978.

Jerry B. Reese
District Ranger; B.S., M.S. in Range Management.

Ted Reiger
Range Staff Assistant; B.S. in Forestry (Range Management).

Robert L. Riddle
Forester (Admin.); B.S. in Range Management.

Glenn Roloff
North Dakota Coordinator; B.S. in Forest Management.

George T. Schaller
Forester; B.S. in Forest Management.

James L. Shell
Forester; B.S. in Forest Management.

Wayne Smetanka
Fire Management Officer; B.S., M.F. in Forestry.

Ronald H. Stellingwerf
District Ranger; B.S. in Forestry.

Bryan R. Stotts
Wildlife Biologist-IPA; B.S., M.S. in Biology.

Lambert Wenner
Social Scientist; B.S. in Education; M.S., Ph.D. in Social Science (sociology — cultural anthropology).

Leroy White
Team Leader; B.S. in Forestry (University of Montana). Eighteen years professional experience involving 10 years in timber management on Kaniksu and Kootenai National Forests, 5 years planning experience on Helena National Forest where he assisted in preparation of five Unit Plans, and five years as Custer Planning Staff Officer responsible for two Final Unit Plans and current Forest Planning effort.

Donese W. Williams
Minerals Assistant; B.S. in Wildlife Management, Minor in Range Management.

CHAPTER VI
CONSULTATION WITH OTHERS

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A. Introduction

This chapter discusses the involvement and consultation with a variety of publics during formulation of the Forest Plan and Final Environmental Impact Statement (FEIS). It also lists and responds to those comments received from public agencies, elected officials and Indian tribes during the public comment period for the proposed Forest Plan and Draft EIS. Appendix D (Public Comments Received) which reproduces all letters received during the public comment period is available for review at the Supervisor's Office in Billings, Montana.

The Forest Service has conducted an active public involvement program throughout the Forest planning process. Federal, State and local government agencies have been informed and consulted. Individual Forest users and interest groups, as well as other interested persons, have had an opportunity to actively participate.

The next section of this chapter, CONSULTATION WITH OTHERS DURING THE PLANNING PROCESS, summarizes public participation through the planning effort and summarizes the number, type, and general tone of comments received during the public involvement period for the Proposed Forest Plan and Draft EIS.

The following section, FREQUENTLY DISCUSSED ISSUES OR CONCERNS, categorizes the public comments and, when appropriate, draws conclusions.

The section, COMMENTS FROM OTHER AGENCIES, ELECTED OFFICIALS, AND INDIAN TRIBES AND THE FOREST SERVICE RESPONSES, reproduce the full text of the comments from these groups and the complete Forest Service responses. All other comments, along with the Forest Service responses to each, are in Appendix D, available for review in the planning records at the Forest Supervisor's Office in Billings, Montana.

The last section, LISTING OF AGENCIES, ORGANIZATIONS, GROUPS, AND INDIVIDUALS TO WHOM THE FINAL ENVIRONMENTAL IMPACT STATEMENT ARE SENT, lists all those to whom copies of this statement have been sent.

B. Consultation With Others Between the Draft and Final Environmental Impact Statements

1. Summary of Public Participation Activities

The Notice of Intent to prepare a Forest Plan and Environmental Statement was published in the Federal Register on March 19, 1981. The Custer National Forest released the Draft Forest Plan and DEIS on April 19, 1985.

Prior to the Forest-wide planning effort as required by the National Forest Managment Act of 1976, the Forest had aggressively pursued the completion of Unit Management Plans for the individual Ranger Districts. This resulted in Management Plans for all but one District (Grand River Ranger District). These planning efforts coupled with an active and on-going dialogue with the Forest's publics had resulted in a good understanding of the major issues and concerns facing the Forest. In order to substantiate this understanding, on May 20, 1981, the Forest mailed out 1,200 letters to people interested or previously involved in long-range planning on the Forest. These letters carried information about the new planning effort that the Forest was about to undertake, provided an overview of previous plans, and asked opinions of major issues for the Forest. Responses were received from 178 people.

The Forest had nearly completed the Draft Forest Plan and DEIS when, in September 1983, the NFMA regulations were amended to require each Forest to prepare, using specific criteria, an inventory of roadless lands and to evaluate each of these areas for wilderness in its land and resource planning process. Previous planning direction had allowed the incorporation of the RARE II Environmental Impact Statement of 1979 to resolve wilderness designation of the inventoried roadless lands. Consequently, the wilderness issue had not been included in the issue identification process. This change, revision, along with other new planning requirements such as economic and additional timber analysis, necessitated a major revision in the DEIS.

On September 13, 1983, the Forest issued a "Roadless Area Evaluation" brochure, indicating the re-analysis of the roadless resource inventory. This information is referred to periodically as "the 1983 Roadless Resource Inventory" to distinguish it from the RARE II inventory done five years earlier. The public was asked to help clarify the wilderness issue, assist in compiling information regarding the inventoried roadless lands on the Forest, and help to identify management options for these inventoried roadless lands. This brochure was sent to approximately 1,200 addressees on the Forest mailing list. The formal public participation period ran from September 13, 1983 to October 31, 1983. About 57 responses were received, summarized, and used in the re-evaluation of the roadless resource on the Forest.

The Proposed Forest Plan and DEIS were filed with the Environmental Protection Agency and made available to the public in April 19, 1985. (The Notice of Availability was published in the Federal Register on the same date.) News releases were also sent to various media in Billings, eastern Montana, and throughout North Dakota. Along with the Proposed Forest Plan and DEIS, the Forest published a Forest Plan Overview which summarized the Plan and DEIS. This Overview was sent to everyone on the Forest mailing list, plus other interested parties, and detailed how to request the entire Forest Plan package. Approximately 175 copies of the entire set of documents were mailed to Federal and State Agencies, elected officials, organization and individuals who continue to be an important part of the Forest's constituency. The deadline for submitting written comments was August 1, 1985. Because the Forest received several requests for an extension, the comment period was extended to September 3, 1985.

After the release of the Forest Plan documents to the public, approximately 32 separate meetings and briefings were held to present the Proposed Forest Plan and to answer any questions.

In addition to soliciting public input, throughout the five-year planning period, many planning meetings were held with District, Supervisor's Office, and Regional Office personnel. All meetings were geared to get interdisciplinary and broad-based employee input into the Plan. Between March 25, 1985 and April 5, 1985, six meetings were held to get employee input on the DEIS and the Proposed Forest Plan.

2. Public Comments Received

The Forest received 931 written comments in response to the Proposed Forest Plan and associated DEIS from interested people and organizations. This included 239 responses to a public survey issued through the Billings Gazette newspaper. A tabulation of the responses, including the origin and affiliation of the commentors, is shown in Tables VI-1 and VI-3. Table VI-2 shows a summary of comments by geographic areas within the Forest. Table VI-4 gives a summary of the number of comments that were received by major resource, issue, or concern.

3. How Public Comments Were Used

Within the broad framework of Forest planning, public input is one of five considerations in the decision-making process. These five factors are: (1) the law, (2) technical information, (3) resource capability, (4) professional judgment and (5) public input. Public input enters into the decision-making process when there is room for interpretation in any of the first four factors, especially with regard to which uses will be emphasized. Public input, for example, would not be a factor in citing a violation of Federal regulations, but it does influence decisions about whether Forest management could emphasize one use versus another.

In accordance with 40 CFR 1503.4, the comments about the Proposed Forest Plan and Draft EIS were treated in the following ways:

- Comments offering technical correction or pointing out inconsistencies were used to revise the final documents.

TABLE VI-1
COMMENTS BY LOCALITY

Comment Origin	No. of Comments Received on Proposed Forest Plan and DEIS
Montana	460
North Dakota	373
South Dakota	28
Wyoming	10
Other States	56
Outside U.S.	0
Unknown	4

TABLE VI-2
SUMMARY OF COMMENTS BY GEOGRAPHIC AREA WITHIN THE FOREST

Geographic Area	No. of Comments Received
Sheyenne National Grasslands	17
Beartooth Ranger Distsrict	281
Sioux Ranger District	164
Ashland Ranger District	161
Grand River National Grasslands	4
Little Missouri National Grasslands	
Medora Ranger District	329
McKenzie Ranger District	257
Absaroka-Beartooth Wilderness	5

TABLE VI-3
SUMMARY OF COMMENTS BY TYPE OF AFFILIATION

Commenter Affiliation	No. of Comments Received
Academic	4
Business/Industry	45
Private Citizen	731
Environmental/Conservation/Civic	58
Forest Service Personnel	1
Other Federal Agencies	16
Local Government	1
State Government	9
Indian Tribes	2
Congress/President/Cabinet	1
Livestock Grazing Permittees	62

TABLE VI-4

SUMMARY OF COMMENTS BY MAJOR RESOURCE/ISSUE/CONCERN

Comments by Major Resource/Issue/Concern	No. of Comments Received
Wilderness Additions/Wilderness Management	691
Wildlife Habitat/Wildlife Management	545
Road Construction and Management	483
Mineral Management (Oil and Gas)	475
Range Management/Livestock Grazing	441
Recreation Management	421
Timber Management	418
Roadless Area Management	383

- Comments requesting clarification or comments resulting from misunderstanding of what was meant in the documents were either clarified and corrected or, if unappropriate to do, explanation given in the Forest's response to the comment.
- Comments that questioned some part of the analysis were used to either clarify, supplement, or modify the analysis in the final documents. Where further analysis was not done, the reason was explained in the response to the comment.
- Comments suggesting changes in the Proposed Forest Plan direction, outputs, and land use assignments were given careful consideration both from an individual standpoint as well as a collective one. Where feasible and appropriate, management area direction in specific areas was changed in response to comments; however, some comments requesting changes in the Proposed Forest Plan did not result in any change and were explained in the resonse to the comment.

The Forest Service use of public comments is documented throughout the final EIS and Plan. A summary of this documentation is as follows:

- The Forest Service responses to individual public comments are displayed in this Chapter and Appendix D. This Chapter reproduces the agencies, elected officials, and Indian tribes and the Forest Service response to each. Appendix D, an appendix to this EIS, is available for review in the planning files at the Forest Supervisor's office in Billings, Montana. Appendix D contains each comment letter along with the Forest Service reply.
- A summary of substantial changes between the Draft and Final Environmental Impact Statements is provided in Chapter I. Throughout Chapters II, III, IV, changes are summarized in a section entitled "Summary Between Draft and Final", as well as being noted where appropriate.
- The consideration of comments collectively is addressed in this Chapter and, more briefly, in Chapter I. In this Chapter, a summary of public comments is discussed by the major resource activity.

4. Summary of Public Comments

The content analysis which follows is a brief summary of public and other agency comments on the major Forest issues. These summary comments are derived from public review of the 1985 DEIS and Proposed Forest Plan. The purpose of the summary is to give the reader a "sense" of what the public said about the Draft documents, not to provide a synopsis of all the comments. For details, the reader should review the individual comments.

It was apparent from reading the comments, that many of those responding did not personally read the DEIS or Proposed Forest Plan or read only certain portions of the documents. Others commented based on data supplied by their friends, employers, or special interest organizations. Some letters reflected almost identical thoughts, viewpoints, and in some cases exact wording.

The majority of comments supported either end of the wide range of Forest management options available. Most letters were antidevelopment expressing the idea that we need to restrict or prohibit oil and gas development, or "we need to save undeveloped areas for future generations". Some letters supported a prodevelopment alternative or the idea of allowing oil and gas, and that "jobs are more important than wildlife". A few letters supported a wide spectrum of multiple use, and some supported the Proposed Action alternative outlined in the NEPA documents. Most letters supported the alternative which best supported their special interest or personal values.

The following were the most frequently discussed issues or concerns expressed by those who commented.

a. Wilderness and Roadless Management Issue

Due to the the nature of the wilderness management/roadless managment issue, and the perception of some of those responding, it is almost impossible to separate the analysis of one (wilderness) from the other (roadless management). From the way many of the commenters used the terms interchangeably, it was evident that to some, "roadless" and "wilderness" were synonymous. Although there is no Congressionally mandated wilderness in North Dakota, many of those responding from North Dakota suggested that "now there are oil rigs where once there had been 'wilderness'". Others expressed the idea that "we in North Dakota should not have to sacri-

fice all our 'wilderness' to energy development". A few responded to the proposed management direction for the existing Absaroka-Beartooth Wilderness. However, the vast majority responded to the proposed management of the current roadless areas on the Forest.

This management issue generated the greatest number of comments. Of the respondants, 691 specifically mentioned some aspect of "wilderness" management, while 383 specifically mentioned "roadless" management. By far, the majority of the comments received concerning the wilderness/roadless issue were directed to the roadless areas in North Dakota.

The wilderness/roadless issue was strongly polarized. Those that opposed additional wilderness usually opposed adding any additional areas to the national wilderness system. Those opposing wilderness or maintaining areas in a roadless status perceived wilderness and roadless management as limiting current and future development activities. In the main, the oil and gas industry and livestock grazing permittees and/or grazing associations voiced the most opposition to wilderness/roadless management designation. The oil and gas industry voiced the opinion that a wilderness/roadless designation is an untenable management option where hydrocarbon reserves exists such as in the Williston Basin. They also expressed the view that most environmental considerations can be protected through appropriate mineral lease stipulations or mitigation measures. The livestock grazing interests were generally opposed to a wilderness/roadless management option because they felt it would limit any future increases in livestock numbers or their ability to construct future range improvements. Most grazing association members voiced the opinion that a wilderness/roadless designation was not in keeping with a multiple-use management philosophy, and that another management option (specifically Management Area B) offered a more balanced approach to management. Some individuals were also opposed to a wilderness/roadless designation. They expressed the view that enough Wilderness and roadless areas already existed in the Theodore Roosevelt National Park, and that, in general, these areas are very lightly used. Others felt that a wilderness or roadless designation was too restrictive and that development was a positive benefit for the local ecocomy.

Most of the people that commented supported either adding to the National Wilderness System or keeping the current areas in a roadless condition. Supporters for a wilderness or roadless designation justified this type of management because the areas include only minimal amounts of oil and gas or timber. Some typical opinions expressed as to why areas should be retained as wilderness or roadless were:

- undisturbed areas are needed for research and scientific study
- we have "sacrificed" enough to industry
- there are too many roads already
- in view of the current "oil glut" there is no reason to allow development in roadless areas; adopt a "go-slow" policy
- development represents an irreversible commitment of resources
- the Forest Plan needs to offer a more balanced alternative for management of the Forest.
- roadless areas are very important for various wildlife species including raptors and threatened and endangered bird species.
- areas of western North Dakota are unique and represent a National treasure
- drilling roadless areas is a "band-aid" approach to energy problems and the tradeoffs are not acceptable.

Still others saw a need to retain some areas in an undeveloped status as a heritage to future generations. Some expressed the idea that all areas should be designated as wilderness. They viewed wilderness as being more permanent and long term than a roadless designation. The areas most commonly mentioned as supported for classification in the National Wilderness system were:

- Twin Buttes (North Dakota)
- Lost Water Canyon (Montana)
- Line Creek Plateau (Montana)

Some supporters for wilderness recommended Alternative "W" as proposed by the Montana Wilderness Association.

b. Wildlife Management Issue

Wildlife management including Threatened and Endangered species was another key issue for the Custer National Forest. Like many of the other issues, this issue was directly related to other issues and concerns on the Forest. It was apparent that many respondents believed that the biggest threat to wildlife would come through the roading of roadless areas, oil and gas activities, grazing, and timber harvest. People concerned about wildlife see activities associated with these programs as detrimental to wildlife. For example, many commenters felt that oil and gas activities and the attendant road building would be detrimental to various wildlife species. They expressed the view that increased roading would lead to increased poaching, loss of habitat through displacement, and loss of security cover. Livestock grazing was cited as another activity that had adverse effects on various wildlife species. Most of the commenters cited existing problems in hardwood draws, damage to stream-

banks, and loss of forage as examples of how livestock grazing adversely affects wildlife. Some commenters thought the problem of overgrazing and streambank degradation was severe enough to warrant fencing in some areas. Many cited timber management activities as adversely affecting wildlife, especially on the Custer Forest. Of those that commented, many spoke specifically in opposition to the timber management activities planned for the Lodgepole-Meyers Creek area on the Beartooth Ranger District and for the Long Pines area on the Sioux Ranger District. They expressed the opinion that the Forest's plan to harvest timber to benefit wildlife was simply a ruse in order to justify increased harvest levels, and the proposed wildlife habitat improvement is not "substaintiated in the literature". Some suggested that the loss of wildlife habitat would be a poor and unacceptable tradeoff for uneconomical logging.

Many of those that commented expressed a favorable opinion concerning the management areas designed to emphasized wildlife values, but felt that in general the plan did not go "far enough" for wildlife. Others suggested that the plan represented only a "paper" commitment to wildlife. Most respondents expressed concern for deer, elk, and bighorn sheep, but several mentioned raptors, sharptail grouse, and prairie dogs.

People who opposed the emphasis on wildlife in the plan were generally livestock producers. They perceived the emphasis on wildlife in the plan as not in keeping with the intent of the Bankhead-Jones Farm Tenant Act. They suggested that livestock grazing should be the first priority and, after all, the ranchers are the ones who feed the wildlife in the winter time. They seemed to be saying that "we have nothing against wildife, but jobs and the ranching way of life are just as important."

c. Road Construction

The Forest Plan proposal to construct roughly 2,000 miles of additional roads over the next 50 years resulted in approximately 500 comments. Commenters expressed concern about several "sub-issues" related to road construction. These included the amount of new roads planned and associated environmental impacts, road construction standards, economics, analysis within the Plan, and the closing of roads.

The vast majority of the people responding expressed concern over the amount of new road construction. Numerous people argued that "there are too many roads now" or "where do we draw the line in roading of public lands". They expressed concern about the impacts on wildlife habitat. People felt that additional roads would destroy some wildlife habitat, and lead to other impacts on wildlife such as unlawful hunting, and displacement due to human activity. Others expressed the opinion that the anticipated level of roading would adversely affect water quality through increased sedimentation. Many others expressed a concern with the impact of new roads on the scenic beauty and recreational opportunities afforded in current roadless areas. Many viewed roads as "scars upon the landscape". Others said that roading the existing roadless areas would change the recreation opportunity from dispersed, non-motorized to motorized. They suggested that "dispersed, non-motorized recreation is what people want". Some commenters suggested freezing road building, especially new roads needed for timber harvest.

Several who responded mentioned road standards. The oil and gas industry suggested that current design standards were too elaborate for oil and gas roads, and that the Forest should make more use of "scratch-grade" roads. They reasoned that this would make reclamation easier and possibly more sucessful in the event a well proved to be dry.

The economics of road building and associated timber management activities also drew criticism from some commenters. Some expressed the opinion that in most areas the timber values were not worth the cost of roading, and that "it is not fair to ask the public to subsidize the destruction of public lands".

Some people said that the Forest Plan analysis concerning road construction was either not clear or insufficient. They said it was difficult to evaluate the analysis and impacts of the anticipated level of roading since there was no map of the proposed transportation network. Another commenter suggested that the Forest needed to be visible with the transportation plan within the documents.

Finally, several people said that the Plan needed to better identify which roads would be closed. Several expressed the opinion that new roads should be temporary in nature and closed after use. It was evident that others thought that the Forest already contained too many roads, and some of the existing roads should be closed.

d. Minerals (Oil and Gas) and Other Mining

Minerals management and specifically oil and gas continues to be one of the most volatile issue on the Forest. Virtually every other Forest issue orginated from the effects or perceived effects of oil and gas activities. For example, those that commented as being against oil and gas development cited perceived adverse effects on the roadless resource, wildlife habitat, and special areas such hardwood draws and the Greater Yellowstone ecosystem as reasons for not leasing for oil and gas.

There was strong public concern with both sides of the issue, including those who felt that the level

of oil and gas production should remain at or near current levels. Those who generally expressed opposition to further or increased oil and gas activities suggested that:

- under the Forest Plan roadless areas will become industrial parks, and the roadless areas are already a scare resource.
- we need to look at other alternatives to meet national energy needs instead of destroying areas that can not be duplicated.
- the small amount of oil and gas under existing roadless areas is not sufficient to warrant development of these areas.
- proposed level of oil and gas activities will have irreversible adverse effects on wildlife habitat, water quality, natural beauty, and special ecosystems.
- the proposed plan continues the policy of "carte blanche" leasing and development.
- roads associated with oil and gas activities will destroy hunting areas.
- the proposed plan is imbalanced in favor of development.
- we need to save some areas as well as supplies of oil and gas for future generations.

Those who opposed oil and gas development activities also cited economic reasons for limiting development. Many commenters pointed to what they termed a present "oil glut" as reason enough to limit oil and gas development or, at least, adopt a "go slow" policy. Others expressed the opinion that the level of oil and gas activity permitted in the proposed Forest Plan would continue to perpetuate cycles of economic "boom and bust" in the local communities. Some responses indicated that the Forest Service was trading off long term benefits for short-term economic gain.

Proponents of increasing oil and gas development activities centered their comments on the belief that mineral management (oil and gas) can co-exist with other resource uses and activities. Some of the commenters suggested that:

- mineral activity does not necessarily disturb or destroy the character of ecosystems, and wildlife populations have increased in times of intensive oil and gas development.
- the effects of mineral activities are temporary and have a low spatial requirement.
- the reclamation practices for oil and gas activities are highly successful and many times leave an area more productive than prior to development.
- industry has a good "track record" of working with the various land management agencies.
- mineral development should be viewed as a legitimate use of our natural resources.
- oil and gas activities provide access to areas for local ranchers and sportsmen.

Many of those who commented in favor of oil and gas management activity supported maintaining the productivity of the soil and water but felt that jobs and the economic stimilus of oil and gas benefited the local and national economies. Some letters stressed that if trade-offs had to be made, jobs and the positive benefits to the local economy were just as important as roadless recreation.

A sub-issue of mineral (oil and gas) management was the issue of enforcement and monitoring of these activities. Several commenters expressed the idea that they were comfortable with mineral management as a legitimate use of public lands, but they also felt that additional monitoring and enforcement was needed.

e. Livestock Grazing

The content analysis showed livestock grazing continues to be a key issue for the Forest. This issue generated approximately 440 separate comments that in some way directly spoke to livestock grazing. Again, from this issue, other issues emerged such as management of hardwood draws. Like many of the other issues, some folks thought the Plan was not doing enough to protect the environment from effects such as over grazing, and a similar number thought that the Plan was too restrictive on livestock grazing in some management areas.

Those supporting more intensive livestock grazing and management frequently expressed the opinion that more of the Forest should be included in Management Area B. There was considerable criticism from the livestock industry and the grazing associations on the Forest's proposal to resolve conflicts in favor of oil and gas and/or wildlife in certain management areas. The livestock industry and grazing associations also expressed the opinion that the proposed Plan departs from the multiple-use concept of management and the intent of the Bankhead-Jones Farm Tenant Act as it relates to the National Grasslands portion of the Forest. They expressed the opinion that under the Bankhead-Jones Farm Tenant Act, the National Grasslands were to be managed to stabilize the economy of the agricultural/ranching communities.

Generally, those who supported livestock grazing and intensive management did not believe the level of livestock grazing should be increased. On the other hand, they did expressed the feeling that if "push came to shove", livestock should be "number 1". Of those supporting livestock grazing, they most commonly cited the following reasons:

- livestock grazing is a traditional use of the area. Local economies are dependent on the livestock/agricultural marketing.
- the plan departs from the basic intent of the Bankhead-Jones Farm Tenant Act which was to emphasize livestock grazing.
- wildlife and livestock can co-exist. Range improvements built for livestock also aid wildlife.

Generally, the opponents of livestock grazing centered their comments on the adverse environmental/economic effects of livestock grazing, and not so much on the level of grazing. Many people felt that continued grazing at current levels would:

- adversely affect water quality due to increased sedimentation and damage to streambank (riparian) areas.
- adversely affect ground nesting birds through cover reduction.
- adversely affect big game species by reducing forage on winter range.
- foster overgrazing on much of the Forest.

One of the more often mentioned reasons for opposing any increase in the level of livestock grazing was its perceived effect on riparian areas or hardwood draws and watershed quality.

Many of those opposing livestock grazing cited economics as a factor that should be considered in the land allocation process. Many commenters expressed the opinion that the public is subsidizing the ranching industry through grazing fees that are substantially lower than rates on comparable private land.

f. Recreation Management

Although recreation management had not been previously identified as a major Forest issue, the comment analysis revealed over 400 comments specific to some aspect of recreation management. By far, the majority of these comments expressed a concern over the reduction in roadless areas and the perceived effects of this on dispersed, non-motorized recreation.

Many of the commenters expressed the opinion that minerals, timber activities, and road construction posed the biggest problem to the Forest in respect to future recreation demand. It was evident that many of those that responded believed that the future recreational demand would be heavy toward dispersed, primitive, non-motorized activities such as back-packing and hunting. Many expressed the idea that the proposed Forest Plan would "short-change" the opportunity for this kind of a recreation experience while providing an excess of motorized recreation through the building of additional roads and the development of existing roadless areas. This opinion seemed to be especially prevalent in the responses from people in North Dakota. Several of the responses from North Dakota mentioned that their perception was that many of the private lands were closed or "off limits" to public use, and this makes the National Grasslands even more important for recreational uses such as hunting. Others stated that the proposed plan would adversely affect the quality of the recreational experience through noise and air pollution, habitat destruction, and unlawful hunting. Still others thought the proposed plan would impact the quality of the recreational experiences inside the Theodore Roosevelt National Park.

It was evident that people were also influenced by what they perceived to be the economics of certain management practices such as timber harvest and road construction. Several commenters expressed the opinion that most logging on the Forest in uneconomical and the associated trade-offs are not justifiable. Some of the respondents from Montana stated that the economic base of the town of Redlodge, Montana is recreation and tourism.

Although there was some support for more developed sites such as campgrounds and trails, most thought that the present number of developed sites would be sufficient in the future. Some commenters expressed the concern of sufficient funds being made available for maintenance in the future.

A few comments were received that expressed the opinion that the proposed Forest Plan placed too much emphasis on recreation. Some suggested that more areas should to be opened for exploration of oil and gas, and maintaining roadless areas created "de facto" wilderness which could only be used by certain groups of people. Others stated that the National Grasslands were agricultural in nature and livestock grazing and the needs of the ranching community should be considered.

g. Riparian and Woody Draw Management

The management of riparian areas and woody draws was identified as a major issue during the issue identification process part of Forest Planning. The content analysis of the public involvement validated this as a continuing issue for the Forest. Approximately 150 individual comments were received which spoke directly to the issue of management of riparian areas or woody draws.

Those that expressed an opinion concerning this issue were unanimous in two respects. First of all, the commenters said that these areas are extremely important for a variety of reasons and deserve special protection and/or management. Secondly, it was evident that the commenters believe the cause of the problem in these areas is due to overgrazing or the improper management of domestic livestock. Numerous people

expressed a concern about impacts to wildlife habitat, water quality, and recreational opportunities.

Even more people recommended a more forceful approach to the management of these areas than presented in the Forest Plan. Several people commented that they felt the plan did not go far enough in the protection of these areas, or that the plan was not clear as to how these areas would be managed to eliminate the impacts of cattle grazing. Others said that the management guidelines were "too general" or that the monitoring and evaluation criteria for these areas were not sensitive enough to the cumulative impacts of livestock grazing. A majority of those that responded to this issue suggested that fencing of these areas should be considered as a viable alternative for management. Other suggestions included more intensive management systems such as rest rotation grazing, and removing livestock once a certain level of use is reached.

h. Timber Harvesting Issue

Although the timber harvesting program on the Custer National Forest is not a major resource program within the Northern Region, this issue generated over 400 comments. Several of the other issues such as roading of current roadless areas orginated from the timber harvesting issue. For the past 10 years the Forest has harvested approximately 1.5 mmbf annually. The Proposed Action outlined in the Draft Forest Plan and DEIS proposed to increase the annual harvest level to 4.0 mmbf. Some that commented responded to this proposed increase and the effects or perceived effects of timber harvesting. Some of the more typical responses suggested that:

- proposed harvest levels represented a "giving in" to pressures from the timber industry.
- any amount of harvest above 1.0-1.5 mmbf/year would be detrimental to many wildlife species.
- timber yields were substantially in error.
- proposed harvest levels would destroy riparian habitat, natural beauty, and would increase sedimentation.
- local demand does not justify such an increase.
- justifying increase in timber harvest levels through improvement of wildlife habitat was not sound.
- timber harvest would be detrimental to the Yellowstone Ecosystem.

Still others surfaced the issue of economics associated with the Forest Service's timber harvest program. Many viewed below cost and deficit sales as subsidizing the timber industry. Many commenters voiced the opinion that below cost timber sales and the associated adverse environmental effects were sufficient reasons for not increasing timber harvest levels.

Part of the timber harvesting issue was related to the potential roading of existing roadless areas, especially on the Beartooth Ranger District. Many of the commenters specifically mentioned the proposed timber harvest activities in the Meyers Creek area of this District. Strong opposition was voiced to the proposed timber activities in this area citing the marginal timber sites, economics of road building, and the adverse effects associated with increased roading, and the impacts on the Greater Yellowstone Ecosystem.

Proponents of increasing the timber harvest centered their comments on the need to increase the timber supply to local mills to sustain jobs and to bolster local economies. Many of those who supported increased timber harvest were livestock grazing interests. They expressed the need to harvest timber in order to increase forage production for wildlife as well as domestic livestock.

C. Agency, Elected Officials, and Indian Tribe Comments and Forest Service Responses

TABLE VI-5

AGENCY, ELECTED OFFICIALS, AND INDIAN TRIBE COMMENTS AND FOREST SERVICE RESPONSES

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U.S. Department of Housing and Urban Development
Denver Regional Office, Region VIII
Executive Tower
1405 Curtis Street
Denver, Colorado 80202

Forest Plan Comment Letter #9

May 2, 1985

Mr. Dave Filius
Forest Supervisor
Custer National Forest
P.O. Box 2556
Billings, Montana 59103

Dear Mr. Filius:

This is in response to your request for comments on the Draft Custer National Forest and National Grasslands Land and Resource Management Plan Environmental Impact Statement (EIS).

This draft EIS has been reviewed with consideration for the areas of responsibility assigned to the U.S. Department of Housing and Urban Development. This review considered the proposal's compatibility with local and regional comprehensive planning and impact on urbanized areas. Within these parameters, we find this document adequate for our purposes, provided that mitigation of urban impacts is addressed in relation to potential mineral production on public lands affecting local communities and their infrastructure requirements. A

If you have any questions regarding these comments, please contact Mr. Howard S. Kutzer, Regional Environmental Officer, at (303) 844-3102.

Sincerely,

For Robert J. Matuschek
Director
Office of Community Planning
and Development

___ SUPERVISOR
___ DEPUTY
___ ADMIN
___ Clc Srv
___ Purch
___ Budget
___ Resource
___ Fin Tech
___ Personnel
___ Computer
___ RANGE
___ Asst
___ Wildlife
___ SAW
___ PIO
___ Info Asst
___ Receptionist
___ Illus
___ Editor
___ PLANNING
___ Asst.
___ Econ.
___ LA
___ TI-AD/FIRE/REC
___ Timber
___ Dispatcher
___ ZONE LAW
___ LANDS
___ Asst
___ Conv Examiner
___ ENGINEER
___ W. Zone
___ MINERALS
___ Asst
___ CULTURAL

A The impacts of mineral production on local communities has been considered in the Draft Environmental Impact Statement (DEIS). Since oil and gas activities have been long standing on the National Grasslands, future significant impacts to local communities are not anticipated. On public domain lands, 50 percent of all mineral related revenues are returned to the States. These funds have generally been used for roads and schools and serve to mitigate some of the impacts from mineral production.

DEPARTMENT OF THE AIR FORCE
AIR FORCE REGIONAL CIVIL ENGINEER CENTRAL REGION
1114 COMMERCE STREET
DALLAS, TEXAS 75242

Forest Plan Comment Letter # 17

7 MAY 1985

Mr. David A. Filius, Forest Supervisor
Custer National Forest
P.O. Box 2556
Billings, Montana 59103

Dear Mr. Filius:

Thank you for allowing us the opportunity to review the Overview Plan for Custer National Forest, Montana, North Dakota and South Dakota. It does not appear necessary that we receive copies of the studies at this time.

We continue to express our support of the Forest Service in developing functional management plans for lands under its control. The Air Force concern for these management issues contains the need to retain use of existing and the establishment of future military flight training areas and routes which may traverse these areas. A

Currently several Air Force air operations including instrument flight training routes traverse portions of the study in question and in all three states. Although flight training areas, routes, and airspace requirements of the military are subject to change and do change frequently, it is not anticipated that new routes will be established in the immediate future. However, if we do propose any change we will keep you informed. B

Mission requirements, fuel costs and environmental constraints determine the decision to locate military training activities. Because of general aviation and population pressures, low level high speed flights are relegated to areas which are least accessible and sparsely inhabited. Therefore, we request that you give full consideration to how planning and management decisions made by your agency may adversely affect or restrict use of low altitude airspace by the military. The Air Force position on this matter is based on the high training and readiness values rendered by use of this low altitude airspace. A

We are hopeful this information is useful in your planning. If additional information is needed, our staff point of contact is Mr. Raymond Bruntmyer, (214) 767-2527, or FTS 729-2527.

EDWARD L[illegible], Chief
Planning and Intergovernmental Affairs Branch

Cy to: HQ USAF/LEEV

214

A We appriciate your support for our long range management planning effort. Other than wilderness designation, there is no management emphasis which would adversely affect or restrict use of low altitude airspace by the military. We have assigned a Low Development Managment emphasis on six areas, described in Managment Area J in the Forest Plan. At least portions of these areas will be used for semi-primitive nonmotorized recreation activities, such as backpacking, camping, hunting, day hiking, and so on. We would appreciate your consideration of our goals for these areas in planning your military training activities.

B We appreciate your continued coordination efforts.

U.S. Department of Transportation
United States Coast Guard

Commandant
United States Coast Guard

Washington, DC 20593
Staff Symbol: G-WP-3
Phone: (202) 426-3300

15477.4b(0021)
3 May 85

Mr. Dave Filius
Forest Supervisor
Custer National Forest
Post Office Box 2556
Billings, Montana 59103

Forest Plan Comment Letter 1 of 1

Dear Sir:

We have reviewed the Draft Environmental Impact Statement and Management Plan for the Custer National Forest, Billings, Montana. We have no comments to offer at this time.

We appreciate the opportunity to assist your efforts in the development of this documentation. We look forward to continued mutual cooperation and coordination of these projects.

A

Sincerely,

W. M. McGOVERN
Chief, Environmental Compliance and Review Branch
Planning and Evaluation Staff
By direction of the Commandant

A We appreciate your taking time to review our proposal.

U.S. Department of Transportation
Federal Aviation Administration

Northwest Mountain Region
Colorado, Idaho, Montana, Oregon, Utah, Washington, Wyoming

17900 Pacific Highway South
C-68966
Seattle, Washington 98168

MAY 03 1985

Forest Plan Comment Letter 57

Mr. David A. Filius
Forest Supervisor
Custer National Forest
P.O. Box 2556
Billings, Montana 59103

Dear Mr. Filius:

We have reviewed your draft Custer National Forest Management Plan and Environmental Impact Statement and do not foresee any impact on aviation and its activity.

Thank you for the opportunity to review your proposed action.

Sincerely,

Joseph R. Harrell
Policy & Planning Officer

A

A We appreciate your taking time to review our proposed Management Plan and DEIS for the Custer National Forest.

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
1135 U. S. POST OFFICE & CUSTOM HOUSE
ST. PAUL, MINNESOTA 55101-1479

REPLY TO
ATTENTION OF: Environmental Resources Branch
Planning Division

May 20, 1985

Forest Plan Comment Letter
73

Mr. Dave Filius
Forest Supervisor
Custer National Forest
2602 1st Avenue North
P.O. Box 2556
Billings, Montana 59103

Dear Mr. Filius:

Thank you for the opportunity to review the management plan for the Custer National Forest. The St. Paul District, Corps of Engineers, has studied flood reduction measures for the Sheyenne River in the vicinity of the Sheyenne National Grasslands.

We have no objections to your management plan and it appears compatible with our flood reduction alternatives. We appreciate the opportunity to comment on your plan and wish to be involved in future coordination.

Sincerely,

E. G. Rapp

Edward G. Rapp
Colonel, Corps of Engineers
District Engineer

A

A We appreciate your review and support of our proposed Forest Plan.

217

NORTH DAKOTA
DEPARTMENT OF AGRICULTURE

Kent Jones
COMMISSIONER

June 3, 1985

Forest
Plan
Comment
Letter
105

Mr. Dave Filius, Supervisor
Custer National Forest
P. O. Box 2556
Billings MT 59103

Dear Mr. Filius:

I have reviewed the overview of your management proposals for Custer National Forest.

I support your selection of alternative No. 6 as proposed action alternative. The multiple-use concept, designed to respond to a variety of resource needs, is preferable.

A

Sincerely,

Kent Jones

Kent Jones
Commissioner

KJ/b

218

A We appreciate your review and support of our Forest Plan Proposed Action (Alternative 6). Alternative 6 (the Proposed Action) has been changed some from the Draft to the Final. For example, in response to public concern in North Dakota for the roadless resource, the Final Forest Plan will recommend a significant increase in acres to be managed in a low development status in North Dakota. The Final Forest Plan will also recommend keeping livestock numbers at or near current permitted numbers instead of recommending a slight increase. The timber production from the Montana portion of the Custer National Forest will be lowered to 3 mmbt annually instead of 4 mmbf as recommend in the Draft Forest Plan.

United States Department of Agriculture
Soil Conservation Service

Federal Building-Room 443
10 East Babcock
Bozeman, MT 59715

June 5, 1985

Forest Plan Comment Letter #107

David A. Filius
Forest Supervisor
Custer National Forest
P. O. Box 2556
Billings, MT 59103

Dear Mr. Filius:

We have reviewed your draft of the Custer National Forest Resource Management Plan.

Possibly, we overlooked the section that has reference to the existence of snow survey sites and electronic SNOTEL (snow survey telemetry) sites on the Custer National Forest.

Presently, there are 8 snow survey courses and 1 SNOTEL site covered under our Memorandum of Understanding between Soil Conservation Service and Forest Service. There is also, a SNOTEL site on Red Lodge Mountain Ski Area that is a replacement for the snow course on Forest Service lands that was destroyed by ski area expansion. All of these are on the Beartooth Ranger District.

We are very concerned that other uses could destroy these sites or that change in land status such as wilderness or special restrictions could affect our access.

It is very essential to our operations that these sites be protected from timbering, roadbuilding or other activity that could affect snow accumulation at the site or destroy the sites.

If possible, we would like to see the plan make reference to these locations and indicate the management action necessary to protect and preserve their integrity as data collection sites.

Also, we would like to be advised of any activity that could affect either our present access or land use changes in the vicinity of these snow courses or SNOTEL sites.

We appreciate the opportunity to comment on this plan.

Sincerely,

Glen H. Loomis
State Conservationist

A

A The Custer National Forest will continue to cooperate with the Soil Conservation Service in their collection of watershed data from snow survey and snow survey telemetry sites. The omission of a Forest-wide management standard was an oversight. The management standard which provides for protection of snow courses is now located under Forest-wide Management Direction for Watershed (Soil and Water Resources), Air Quality.

The Soil Conservation Service is an agency of the Department of Agriculture

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THREE AFFILIATED TRIBES • FORT BERTHOLD RESERVATION

Mandan, Hidatsa, and Arikara Tribes

TRIBAL BUSINESS COUNCIL

P.O. Box 220 • New Town, North Dakota 58763 • (701) 627-4781

Forest Plan Comment Letter #127

June 13, 1985

David A. Filius
Custer National Forest Supervisor
2602 1st Avenue North
P. O. Box 2556
Billings, MT 59103-2556

RE: Draft EIS Custer National Forest

Dear Mr. Filius;

The Three Affiliated Tribes tribal government has reviewed the Draft Envirionmental Impact Statement (DEIS) for the Custer National Forest. Both the document and the proposed actions and alternatives are well thought out and indicate the Forest Service has a sincere desire to manage these public lands in accordance with the National Forest Management Act and other applicable laws and regulations. A

In part, because Management Area K abutts the western boundary of the Reservation the Tribes are particularly interested in its long range management. Is it possible that the areas recomended for classification as a Special Interest Area, under 36 CFR Section 294.1, and inclusion in the National Register of Historic Places extend onto the Reservation? If so, to what extent? B

It is our understanding that Table Butte, presently in Management Area B, is of greater religious significance than Chimney Butte which is included within Area K. We realize that the land is not under Federal ownership; however, none of Section 16, T. 151 N., T. 95 W., appears to be Federal land. Is it not possible that Management Area K could be extended eastward to include an additional 360 acres in Section 3, T. 151 N., R. 95 W. C

(over)

Alyce Spotted Bear
Tribal Chairman

Gordon Blake
Vice-Chairman
West Segment

John Charging
Secretary
North Segment

Dennis Huber
Treasurer
South Segment

Paul Good Iron
West Segment

Pete Coffey
East Segment

Donald Malnourie
East Segment

Tillie Walker
West Segment

Ernest Stone
South Segment

Edmund White Bear
East Segment

Marie D. Wells
Northeast Segment

220

A Thank you for your review of our Draft Forest Plan and EIS. We appreciate your support of the Proposed Action alternative.

B The management of the Reservation is determined by its Peoples--as it should be. The Forest Service by its Plan would never infringe on this autonomy of the Three Affiliated Tribes. Your suggestion is beyond the scope, purpose, and authority of this plan.

C Our managment authority does not extend to lands in private ownership. In the end, the management direction for this area will be determined by the owner.

#127 p2

An additional matter of interest concerns oil and gas exploration activities. The Tribe commends the Forest Service for restricting the times when geophysical activities can be conducted. We wonder why the period from October 15 to May 15 was selected. Also, items 5.b.1) and 2) seem to conflict. D

In summary the DEIS is an excellent document. The thought and consideration the Forest Service has given to Native American religious values and traditional usage is highly commendable. However, the Tribes believe that Management Area K should be expanded by 360 acres to include Table Butte. If you or your staff have any questions please feel free to call me or tribal staff at (701) 627-4781. C

Sincerely,

Alyce Spotted Bear
Tribal Chairman

ASBirs

xc: Natural Resources Department

D The period of October 15 to May 15 was selected after consultation with the Hidatsa Tribe. They identified this period as being the period of least sensitivity in terms of religious values and traditional usage.

Management Standards 5.b.1) and 5.b.2) for Management Area K do not conflict. Management Standard 5.b.1) applies to the core area within this management area as defined in part A. Description of Management Area K. Management Standard 5.b.2) applies to the remainder of Management Area K. This was not clear in the DEIS and has been clarified in the FEIS.

NORTH DAKOTA FOREST SERVICE

Southwest District Forester Dickinson, ND 58601 (701)-225-6743

ROBERT E JOHNSON
State Forester
Agriculture Bldg
N.D. State University
Fargo, N.D. 58105

MERTON R PETERSON
Dir. of Bus. Affairs
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Bismarck, ND 58505-0179

ROBERT A HARSEL
S.E. Dist. Forester
& Wood Utilization Spec.
Box 608
Lisbon, ND 58054

DOUGLAS R SKINNER
S.W. Dist. Forester
& Urban Forestry Spec.
Pulver Hall 6th Floor
Dickinson, ND 58601

RICHARD GILMORE
Tree Improvement Spec.
N.D. Forest Service
1st & Simrall Blvd
Bottineau, ND 58318

N.D. FOREST SERVICE SHOP
Box 21 A Forestry Drive
Bottineau, ND 58318

June 19, 1985

Forest Plan Comment Letter #129

Mr. Dave Filius
Forest Supervisor
Custer National Forest
P.O. Box 2556
Billings, Montana 59103

I am writing in regards to your request for public input into the new management plan for the Custer National Forest. It is my understanding the the proposed plan will not allow any cutting of timber products and/or for management of the timber resource on the National Grass Lands. The North Dakota Forest Service has been working the last three years with the owners of the Logging Camp Ranch, headquarters are located in section 17, T136N, R102W Robert and John Hanson on management of their timbered land. They have; set up a sawmill, sold posts, poles, boards partially processed logs, natural grown Christmas trees, cuttings for wreaths, and thinned ponderosa pine.

Based on my work with the Logging Camp Ranch I have observed the following.

1) Basal Area is as high or higher than 120 sq. ft./acre in some areas.
2) The ponderosa pine is basically an even age stand between 40 and 60 years old. Certainly much older trees can be found.
3) The ponderosa pine is invading the grass land.
4) Usable log size to an eight inch top is small; one-half to one log, but merchantable products can be cut.
5) With the current rate of cutting additional sturdies will be needed before the next management plan is written.

A

I request you consider multiple use forest management practices for the proposed management plan in the afore mentioned area for the Custer National Forest.

If I can be of any assistance please let me know.

B

Sincerely yours,

Douglas R. Skinner

Douglas R. Skinner
Southwest Dist. Forester
Urban Forest Specialist

cc Dr. Robert Johnson, State Forester
John Hanson, Logging Camp Ranch
Ron Hendrick, U.S.F.S.

TREES FOR TOMORROW

A The area in question is what is commonly referred to an the Ponderosa Pine area within the Little Missouri National Grassland portion of the Forest. This area is not classified as "suitable" timber and as such is not used in computing the programmed timber sales for the Forest. Timber Suitability is discussed in the DEIS and Appendix B to the DEIS.

The Management Standards for this area is contained in the direction for Management Area D of the Forest Plan. The management objective is to allow silvicultural treatments in this area but only to perpetuate the pine stands. Silvicultural treatments may include burning or timber harvest for local demands if consistent with the overall management objective and wildlife considerations.

B The management direction for Management Area D as it specifically relates to the Ponderosa Pine Area provides for the continuation of a multiple-use management philosophy.

United States Department of Agriculture
Soil Conservation Service
Federal Building, Room 443
10 East Babcock Street
Bozeman, MT 59715

June 21, 1985

Forest Plan Comment Letter # 138

Dave Filius
Forest Supervisor
USDA Forest Service
Custer National Forest
2602 1st Avenue North
P.O. Box 2556
Billings, MT 59103

Dear Mr. Filius:

Thank you for the opportunity to review and comment on the Custer National Forest Plan. SCS staff has no comments to offer. A

Sincerely,

Glen H. Loomis
State Conservationist

A We appreciate your taking time to review the Proposed Forest Plan and DEIS.

Meeting Location Amidon, North Dakota

Meeting Date June 24, 1985

Custer National Forest
Supervisor's Office
P.O.Box 2556
Billings, MT., 5911

Forest Plan Comment Letter # 139

We'd like your comments!
-- ON THE PROPOSED CUSTER NATIONAL FOREST PLAN

The Slope County Commissioners met on June 24, 1985, with the following members present, i.e. Merle Hayden, Ralph Urlacher and Gene Bergquist.

The Slope County Commissioners are in favor of "Plan Six".

We feel that grazing is a very important part of the Multiple Land Use Plan and should be kept at about the same as now or increased if possible with good management and conservation practises. We are opposed to all wilderness areas, roadless areas and Game Management areas. A

The following are some reasons we are opposed to these special areas:

1. Under the Multiple Land Use Plan we feel that grazing is part of the Multiple Use Plan and if some of these special use areas are put into effect it will defeat the purpose of the Multiple Land Use Plan.
2. Roadless areas-with the private and federal land intermingled it is almost impossible to set up roadless areas as the law states that we have to furnish suitable roads in and out of farm and ranch homes for fire, emergencies, weed control, etc. B
3. Wilderness Areas-We feel there is no way to control noxious weeds such as leafy spurge, knapp weed, canadian thistle, etc., which has become quite a problem within the past few years and will become a very serious problem if left unattended.
4. Game Management Area-Under this Plan there would be restricted grazing thus leading to a greater fire danger, more predators and noxious weeds could become a greater problem than at present.

224

Your Name Merle Hayden
Merle Hayden, Chairman, Slope County Commissioners
Address Amidon, North Dakota 58620

City _____ .State _____ .Zip# _____

A The Forest Plan recognizes the importance of grazing as well as many other aspects of multiple use to the Custer National Forest. In the Final Forest Plan, we have recommended that the level of livestock grazing remain at or near current permitted levels. The stocking level on some allotments may be increased, while others may have to be reduced to correct resource management problems or to meet other resource management goals and objectives. These stocking adjustments will be accomplished through project level planning developed in the Allotment Management Plan (AMP).

B The impacts of wilderness designation, roadless management, and wildlife management have been analysed and considered in the DEIS (Chapter 2 and Chapter 4). As in the Draft Forest Plan, the Final Plan recommends no areas in North Dakota for inclusion in the National Wilderness system.

The Final Forest Plan recommends an additional 3 areas or approximately 40,000 acres to be managed as Low Development Areas. During the public comment period the Forest received a significant support for this type of management for inventoried roadless areas. The analysis of impacts of this management strategy on grazing, and access needs is insignificant and is discussed in the FEIS (Chapter 4).

As previously stated, some grazing allotments may have to be reduced to either correct existing resource management problems or to meet resource management goals and objectives as now outlined in the Final Forest Plan for specific areas. Livestock grazing allotments within Management Area C (wildlife emphasis) would possibly run a greater risk of a reduction in stocking. In the final analysis, each allotment must stand on its own merits.

DEPARTMENT OF THE AIR FORCE
AIR FORCE REGIONAL CIVIL ENGINEER CENTRAL REGION
1114 COMMERCE STREET
DALLAS, TEXAS 75242

Forest Plan Comment Letter # 151

Mr. David A. Filius, Forest Supervisor
Custer National Forest
P.O. Box 2556
Billings, Montana 59103

Dear Mr. Filius

Thank you for allowing us the opportunity to review the draft planning documents for the Custer National Forest in Montana, North Dakota and South Dakota.

We continue to express our support of the Forest Service in developing functional management plans for lands under its control. The Air Force concern for these management issues contains the need to retain use of existing and the establishment of future military flight training areas and routes which may traverse these areas.

Currently several Air Force air operations including instrument flight training routes traverse the Beartooth, McKenzie, Medora and Sioux W ½ Ranger District portions of the study area. No flights presently traverse the Ashland, Grand River, Cheyenne, and Sioux E ½ Ranger Districts. Although flight training areas, routes, and airspace requirements of the military are subject to change and do change frequently, it is not anticipated that new routes will be established in the immediate future.

Mission requirements, fuel costs and environmental constraints determine the decision to locate military training activities. Because of general aviation and population pressures, low level high speed flights are relegated to areas which are least accessible and sparsely inhabited. Therefore, we request that you give full consideration to how planning and management decisions made by your agency may adversely affect or restrict use of low altitude airspace by the military. The Air Force position on this matter is based on the high training and readiness values rendered by use of this low altitude airspace.

We are hopeful this information is useful in your planning. If additional information is needed, our staff point of contact is Mr. Raymond Bruntmyer, (214) 767-2514, or FTS 729-2514.

Sincerely

DON-MICHAEL BRADFORD, Captain, USAF
Director, Environmental Planning Division

Cy to: HQ USAF/LEEV

See response to letter 019.

United States Department of the Interior

NATIONAL PARK SERVICE

MIDWEST REGION
1709 JACKSON STREET
OMAHA, NEBRASKA 68102-2571

Forest Plan Comment Letter #185

IN REPLY REFER TO:
L5817 NCT-ND
(MWR-RE)

JUL 10 1985

Mr. Dave Filius
Forest Supervisor, Custer National Forest
P.O. Box 2556
Billings, Montana 59103

Dear Mr. Filius:

We appreciate the opportunity to review the draft Custer National Forest and National Grasslands Land and Resource Management Plan. Our interest in the plan is the consideration given to the North Country National Scenic Trail in the Sheyenne Ranger District.

We found the plan gives very adequate consideration to the trail. We were pleased to find the following statement on page II-57 of the Draft Environmental Impact Statement: "The construction of the North Country Trail on the Sheyenne Ranger District occurs in each alternative." The intent to construct the trail is also clearly stated on page II-19 of the draft plan. This firm commitment is appropriate and appreciated.

The following minor revisions are suggested for the final land and resource management plan:

1. Near the bottom of pages III-3 and V-29 of the draft plan where it appears you intended to give the full name of the trail, "National" should be added to the name, i.e. North Country National Scenic Trail.

2. The last sentence of the first paragraph on page III-3 might be revised to read as follows: "The North Country National Scenic Trail, authorized by Congress in March 1980 to extend 3,200 miles from eastern New York State to Lake Sakakawea, crosses through this area." Although it is a minor technical point, it is no longer correct to refer to the North Country Trail as "proposed" since Congress has now authorized its construction. In addition, this suggested revision will help clarify the legal status of the trail for users of the plan.

We appreciate the opportunity to provide these comments and look forward to implementation of the plan and construction of the trail. If we can assist you in that effort in some way, please call on us. I can be reached at 402-221-3481.

Sincerely,

Thomas L. Gilbert

Thomas L. Gilbert
Coordinator, North Country
National Scenic Trail

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A

B

C

A The Forest appreciates your taking the time to review and comment on the Proposed Forest Plan.

B This change has been made in the Final Forest Plan.

C This change has been made in the Final Forest Plan.

Forest Plan Comment Letter #194

NORTH DAKOTA FOREST SERVICE

State Forester Horticulture Bldg., NDSU, Fargo, ND 58105 (701)-237-8174

ROBERT E. JOHNSON
State Forester
Horticulture Bldg
N.D. State University
Fargo, ND 58105

MERTON R. PETERSON
Asst. for R.A. Affairs
N.D. Forest Service
Bottineau, ND 58318

WALT PASICZNYK
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JOHN VAN ELLS
Staff Specialist
Insect & Disease &
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THOMAS KARCH
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& State Forest Mgmt. Spec
Box 21 A Forestry Drive
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LARRY A. KOTCHMAN
N.E. Dist. Forester
& Forestry Incentives Spec
N.D. Forest Service
Walhalla, ND 58282

ROY LAFRAMBOISE
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Towner Nursery
Box 113
Towner, ND 58788

GERALD E. BUNRE
S. Central Dist. Forester
& Wildland Fire Spec
Hwy Bldg 600 E. Blvd Ave
Bismarck, ND 58505-0178

ROBERT A. MARSEL
S.E. Dist. Forester
& Forest Utilization Spec
Box 606
Lisbon, ND 58054

DOUGLAS R. SKINNER
S.W. Dist. Forester
& Urban Forestry Spec
Fulver Hall, 6th Floor
Dickinson, ND 58601

RICHARD GILMORE
Tree Improvement Spec
N.D. Forest Service
1st & Simrall Blvd
Bottineau, ND 58318

N.D. FOREST SERVICE SHOP
Box 21 A Forestry Drive
Bottineau, ND 58318

July 11, 1985

David A. Filius
Forest Supervisor
Custer National Forest
USDA Forest Service
2602 First Avenue North
Billings, MT 59103

Dear Dave:

This is relative to the proposed plan for the Custer National Forest.

I had the opportunity to attend the public meeting here in Fargo and hear comments from various groups that proved quite interesting.

The North Dakota Forestry Agency philosophically supports a multiple use management policy with respect to public land management. We favor implementation of alternative #6. A

Sincerely,

Bob Johnson

Robert E. Johnson
State Forester

REJ:vl

cc: Glenn Roloff

A The Forest appreciates your support of our Proposed Forest Plan alternative and taking time to review and comment on our proposal. The Final Forest Plan does makes some significant changes over the Draft Forest Plan. Some additional 30,000 acres of roadless acres will be managed as low development areas in North Dakota. In addition, the livestock grazing will remain at or near current level instead of a slight increase as projected in the Draft Plan. Timber harvest for the Montana and South Dakota portion has been reduced from 4 mmbf annually to 3 mmbf (reference Record of Decision). We believe the changes we have made in the Final Plan offers the best mix of resource outputs, and services to our publics.

SCLA197-15/16

STATE OF SOUTH DAKOTA

WILLIAM J JANKLOW
GOVERNOR

EXECUTIVE OFFICE
STATE CLEARINGHOUSE SIGNOFF

Forest Plan Comment Letter # 205

APPLICANT

July 16, 1985

USDA/Forest Service
P.O. Box 2556
Billings, Montana 59103

SAI#: SD850416-E05

Amount: $ N/A

ATTN: Dave Filius

FEDERAL DEPARTMENT OR AGENCY: USDA

TITLE OF PROPOSAL: Proposed Forest Plan for Custer National Forest

The Office of State Government Operations in its capacity as the State Clearinghouse has distributed for review the above named Plan. State agencies and local governments interested in or affected by the proposal were provided copies. No comments were received.

Thank you for the opportunity to review and comment on this draft plan.

Sincerely,

Connie Tveidt

Connie Tveidt
State Clearinghouse Coordinator
State Government Operations

CT:cjt:SCL

No response is necessary.

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United States Department of Agriculture
Soil Conservation Service
P. O. Box 1458
Bismarck, ND
58502

Forest Plan Comment Letter #349

July 26, 1985

Mr. Dave Filius
USDA Forest Service
2602 1st Avenue North
P.O. Box 2556
Billings, MT 59103

Dear Mr. Filius:

The Soil Conservation Service has reviewed the Custer National Forest Proposed Forest Plan and supporting documents. We have the following comments:

1) Increasing oil and gas production while increasing livestock grazing will likely lower range conditions and further lower wildlife habitat values. A

2) Implementation of range management techniques such as utilizing only 50 percent of current years grass growth, rest rotation systems, and range improvements (fencing, water developments and salt placement) would lessen potential adverse range conditions and wildlife habitat values. B

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We appreciate the opportunity to comment.

Sincerely,

Allen Stutley ACTING

August J. Dornbusch, Jr.
State Conservationist

The Soil Conservation Service is an agency of the Department of Agriculture

A The impacts of livestock grazing and mineral exploration/development on wildlife habitat have been considered in the EIS (Chapter II and Chapter IV) and in the Forest Plan (Chapter IV-Monitoring and Evaluation). The Forest Plan contains very specific management standards and guidelines for the management of all activities in relationship to the major wildlife species of concern to the Forest, including T&E species. See Forest-wide standard #4. Wildlife and Fish b. 1)-6), c. 1)-3) and e. 1)-4). In addition specific management direction has been established for key wildlife habitats including woody draws and riparian areas as well as for Management Areas C and D. The level of livestock grazing has been reduced in the Final Forest Plan in response to concerns expressed about impacts to wildlife habitat.

In addition, monitoring and evaluation (Chapter IV Forest Plan) will be a key part of our efforts to determine the effects of various management activities on other resources, use, and considerations. These monitoring requirements specify the acceptable impacts to wildlife habitat. If exceeded, action will be taken to correct or stop the activity causing the problem.

B Agree. There are many management techniques that can be utilized to improve wildlife habitat or to mitigate potential adverse effects. The Forest Plan does not address project level planning. Although the Plan provides for the implementation of intensive range management systems, each grazing allotment is unique. The appropriate grazing system, range improvements, and coordination will be addressed in site specific Allotment Management Plans (AMP) which will be developed under the broad "umbrella" of management direction provided in the Forest Plan.

United States Environmental Protection Agency
Region 8, Montana Office
Federal Building
301 S. Park, Drawer 10096
Helena, Montana 59626

EPA

Ref: 8MO

JUL 3 1 1985

Forest Plan Comment Letter #402

Mr. David A. Filius
Forest Supervisor
Custer National Forest
Box 2556
Billings, Montana 59103

Dear Mr. Filius:

We have completed our review of your Agency's draft environmental impact statement for the "Custer National Forest and National Grasslands Land and Resource Management Plan". We have conducted this review under authority of Section 309 of the Clean Air Act.

Our specific comments are as follows:

(1) The summary Overview Plan states on page 5 that the proposed alternative will reduce the currently identified roadless area from 258,280 acres to 52,040 acres. This contrasts with the current management alternative which recommends retaining 189,350 acres in roadless status. The very large difference in roadless areas is apparently due to possible development of existing and future oil and gas leases. A

On p.II-37 of the Draft EIS, there is a statement that "roading would increase from the current 3,803 miles to 5,660 miles in the next 75 years ...to allow development of timber and oil." The next sentence indicates, however, that "many other roads would be built ... to provide access for oil development above and beyond the 5,660 miles which would be public access roads." The Forest Plan should be more definitive in describing oil access roading plans and, in our view, should carefully consider the impacts related to the loss of approximately 75 percent of the present roadless area for this activity. B

The erosion potential for this magnitude of change should be a significant concern. C

(2) P.II-40 of the Forest Plan says that industry will provide self-regulation for salt water spills. The Forest Service should require industry to have a salt water spill prevention plan prior to producing any salt water. In addition, the action levels for responses to salt water spills that are listed on p.IV-13 of the Plan appear to be too lenient. For example, no further evaluation is made until after three unreported spills have occurred and the responsible party is known. D

(over)

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A The varying amounts of roadless/wilderness management by alternative is a function of the intent of a particular alternative. The analysis of the effects on the roadless/wilderness resource by management prescription is detailed in Appendix C to the DEIS. The major Forest activity that affects the roadless character of the inventoried roadless areas is road building associated with mineral and timber management. In response to public comments, the Forest is recommending an additional three areas totally approximately 18,000 acres to be managed in a Low Development status in the Final Forest Plan.

B The analysis presented in the DEIS indicates that approximately 1,850 miles of additional system roads would be needed over the next 75 years in order to accomplish the goals and objectives of the Proposed Forest Plan. This would mean approximately 25 miles of system road construction per year to allow primarily for the production of oil and gas and to a lesser extent timber harvest. These roads would be retained to serve as part of the necessary Forest Transportation System. Your quote of portions of paragraph 3 on Page II-37 of the DEIS concerning "many other roads to be built" is incorrect. As stated in the DEIS, this portion of Page II-37 reads as follows: "...other roads would be built that would provide the access for this resource (oil and gas) development. Unlike the 5,660 miles of roads, these roads would not be for public use nor would they be retained for a permanent transportation system". Perhaps the wording is not clear as to which roads would be retained and those that would be closed. This has been clarified in the FEIS.

The impacts of mineral production on the roadless resource of the Forest have been analyzed in the DEIS (Chapters II, IV, and Appendix C). Many of the roadless areas on the Forest are currently leased for mineral exploration and development, contain split mineral estates (private minerals underlying Federal surface ownership), or contain mineral leases currently held by production. In response to public comments, the Forest is recommending an additional three areas totally approximately 18,000 acres to be managed in a Low Development status in the Final Forest Plan.

C Roads can be a source of significant erosion if not properly constructed. Road construction standards are discussed in Chapter II of the Forest Plan. In addition all Forest projects will meet State water quality standards. Best Management Practices as set forth in the Forest Plan will be followed. Management activities may cause short-term increases in sediment production, but these will be within the acceptable limits of the State water quality standards. Natural variation in water quality, especially in the Little Missouri National Grasslands, are typically much more severe than impacts caused by National Forest management.

p27#402

(3) There should be before and after water quality monitoring for selected timber and road construction projects. The monitoring item number F1 on p.IV-11 of the Plan does not contain enough detail. Further evaluation of sedimentation problems should be done if "after" monitoring shows greater than 30 percent increase in sedimentation over "before" monitoring. E

(4) The DEIS and Forest Plan do not offer a great deal of information on potential water quality impacts of the proposed alternative. Though the Plan (pps.IV-36-37) does indicate that BMPs will be applied to project activities to assure meeting or exceeding State water quality standards, an assumption seems to have been made that the eastern part of the forest is too dry to have water quality impacts and most of the Beartooth section is beyond worry because it is included in a Wilderness classification. The fisheries section (pps.II-25-26) indicates that activities will not degrade present quality of the water flowing on or off national forest lands. F

The proposed alternative (No. 6) involves one of the highest levels of oil and gas production and roading of the alternatives evaluated. There also appears to be an increase in grazing over the current forest management direction. We would point out that even with the application of BMPs the only way to assure protection of water quality is to monitor for changes in water quality and for changes in the aquatic communities. G

The information on the Custer Forest's monitoring program is scanty. It indicates that soil and water resources of "selected drainages" on each ranger district will be monitored (pp.II-37) to characterize current conditions and to verify trends resulting from resource use. Where live water exists it is indicated that water quality will be measured for turbidity, microbiology and benthic community. No budget for monitoring is shown on pp.IV-11 of the monitoring and evaluation plan. Indications are that seasonal monitoring on selected sites will be performed.

We must emphasize the need for an adequate monitoring program to evaluate impacts of project activities upon water quality. More detail should be provided on your monitoring plans. H

According to EPA's system for rating draft impact statements, this DEIS is rated EC-2 (Environmental Concern, inadequate information). This rating is based upon our concerns about inadequate baseline air and water quality data and insufficient plans and budget for collecting new data. If you have any questions, please call Mr. Dick Montgomery of this office.

Sincerely yours,

William E. Engh

for John F. Wardell, Director
Montana Office

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D The individual operators (oil and gas) are required to include in their Application for Permit to Drill (APD) a plan detailing how they will dispose of any produced waters. The Forest Service in conjunction with the BLM must approve this plan as part of the APD. Typically, two types of saltwater spills can be encountered. The first is at the well site; the second is incident to transporting saltwater to disposal locations (disposal wells). It is with this second type of spill that we are encouraging industry and leaseholders to provide strict self-policing. The Monitoring Item G4 is somewhat unclear. Forest Direction in #8. Mineral and Geology d.2) specifies that all instances of damage to Forest Service System Lands from saltwater generated through gas and oil exploration and production will be investigated. This has been clarified in the Final Forest Plan (Chapter IV).

E Agree. The Soil, Air, and Water monitoring portion of the Monitoring and Evaluation Section (Chapter IV) of the Forest Plan has been rewritten.

F The discussion entitled Watershed in Chapter II has been expanded in the Final EIS. This discussion now includes a ranking by alternative of the estimated relative sediment risk.

G The level of livestock grazing has been reduced in the Final Forest Plan. Instead of a slight increase, livestock grazing will remain at or slightly below the current permitted 875,000 A.U.M's grazed annually. The watershed portion of the monitoring plan has been rewritten to provide more detail. Monitoring and implementing BMP's will be a key part of our efforts in implementing the Forest Plan. Where available, historical base line data coupled with new data will be used to monitor watershed changes. If limits established in the Forest Plan are exceeded, the activity causing the impact will be altered or stopped. If monitoring of a project cannot be accomplished, the project will be dalayed until it can be monitored.

H See responses E and G above.

State of North Dakota
DEPARTMENT OF UNIVERSITY & SCHOOL LANDS
Capitol Building
Bismarck, North Dakota 58505
701/224-2800

forest Plan Comment Letter # 471

August 12, 1985

Dave Filius
Forest Supervisor
2602 Lst Ave. North
P.O. Box 2556
Billings, MT 59103

RE: Draft - Custer National Forest and National Grasslands Land and Resource Management Plan.

Dear Mr. Filius:

We have reviewed the Draft Management Plan and were generally pleased with its content. The concept of generally managing the Little Missouri National Grasslands for multiple use while providing additional emphasis on specific uses in smaller key areas appears to be a reasonable management approach. We agree with the elimination of the Essentially Roadless Areas in recognition of the existing and potential oil and gas development. We also support the elimination of the proposed Twin Buttes wilderness area. The Twin Buttes area is an unnecessary duplication of existing designated wilderness areas in North Dakota. Its severe infestation of leafy spurge and the control program which should be implemented also further reduces any value it may have in an undeveloped state. A

The Little Missouri River was designated a Scenic River by the State of North Dakota in 1975. In consideration of that designation, we support the visual quality rating of "retain" for those areas which are visible from the river. It is important to maintain the scenic qualities of the Little Missouri River which led to its special status. The Little Missouri River is a valuable natural resource which should be protected and enhanced. B

With respect to North Dakota State school lands, Section 16, T151N, R95W, McKenzie County should be deleted from management area "K". Our existing leases are in conflict with the proposed U.S. Forest Service restrictions and we are not in a position to restrict geophysical operations to the October 15 to May 15 time C

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A We appreciate your taking time to review and comment on our Proposed Forest Plan, and your support of our proposed alternative. Although there is a high potential for oil and gas reserves in identified essentially roadless areas, much of these areas remain roadless or in a low development status. During the public involvement process, many commenters expressed the opinion that some of all of these areas should be retained in an undeveloped character to protect their near-naturalness. The Final Forest Plan and EIS has been changed to reflect the public response to this issue. The Final Forest Plan and EIS recommends an additional 30,000 to low development management (non-wilderness). This includes the Twin Buttes area.

B Agree. Our management direction for visual quality within the seen area of the Little Missouri River remains as "Retention".

C The direction in the Forest Plan for the Custer National Forest applies only to those lands under Forest Service administration. This direction and our management perogratives does not extend to any lands of other ownership. Section 16, T151N, R095W, is included in Management Area K only to simplify the delineation between two management areas (in this case Management Areas E and K). Reference map for the McKenzie Ranger District, Proposed Alternative.

p2 #471

period. We are also unable to prevent surface occupancy of the leases on that Section. Such restrictions can only be considered by the Board of University and School Lands. Restrictions on the other management areas are also only valid to the extent that they don't conflict with present and future State management. The State must maintain the right to gain access to these lands both for grazing and for mineral development. We cannot approve any measure which would lessen the value of the land or the minerals to the State. C

We have experienced a significant amount of road construction for oil and gas development purposes in the Little Missouri National Grasslands. We strongly endorse the obliteration of the majority of these roads upon abandonment by the oil and gas industry. Such a policy is followed on North Dakota State school lands to prevent the taking of the land without compensation. If such roads are to be part of a U.S. Forest Service road system, then either the U.S. Forest Service or the county must acquire the title and take maintenance responsibility. It must be understood that, the only method which would allow a portion of a U.S. Forest Service road system to remain in place on State school lands is for a public entity to purchase the right-of-way. This factor should be carefully considered in the possible retention of oil development roads which may cross State school lands. In addition, it appears that since oil and gas development created the need for many of the new roads, that need should decline as oil and gas production declines. D

Our final observation is that the anticipated amount of noxious weed control in the plan appears to be grossly under-estimated. Noxious weed control is proposed for only 580 acres in the 1,260,306 acre Management Area B. The amount of leafy spurge in the Little Missouri National Grasslands alone far exceeds that figure. Therefore, it is an unrealistic under-estimation of the need for noxious weed control. E

Thank you for the opportunity to comment on this plan. Please contact us if you have any questions concerning our comments.

Sincerely,

R.E. Lommen

R.E. Lommen
Land Commissioner

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D Your described policy is in agreement with long standing Forest Service direction.

E The number of acres of noxious weed control for Management Area B was incorrect in the Draft Forest Plan. This has been corrected in the Final Plan.

NORTH DAKOTA GAME & FISH DEPARTMENT

"Variety in Hunting and Fishing"

100 North Bismarck Expressway
Bismarck, North Dakota 58501-5095
Phone: (701) 221-6300

Forest Plan Comment Letter #545

August 19, 1985

Mr. David A. Filius
Forest Supervisor
Custer National Forest
P.O. Box 2556
Billings, MT 59103

Dear Mr. Filius:

Enclosed you will find the comments of the North Dakota Game and Fish Department relative to the Draft Forest Plan - Custer National Forest.

It has been nearly five years since we started our involvement in this planning process; it has been frustrating as well as rewarding. It has been a time consuming process, but the hard work is just beginning. In the years to come, the mettle of the plan will be tested. Many changes in management are proposed, and much needs to be accomplished. As will be evident in our comments we are generally very pleased with the proposed plan, but feel strongly that certain final additions and adjustments are needed to assure proper implementation. The framework is in place; how it works will become evident in the next few years.

This planning process has allowed our respective agencies to develop a healthy working relationship. It is my hope and intent to build on that relationship and continue it into the future. Best personal regards.

Sincerely,

Dale L. Henegar
Commissioner

DLH:ah
Encl.

Dale L. Henegar
COMMISSIONER

Charles H. Schroeder
DEPUTY COMMISSIONER

p2 545

NORTH DAKOTA GAME AND FISH DEPARTMENT COMMENTS ON THE DRAFT CUSTER NATIONAL FOREST AND NATIONAL GRASSLANDS LAND AND RESOURCE MANAGEMENT PLAN.

Our comments on the proposed plan are organized as follows:

Part I - Overview of state wildlife management objectives.

Part II - Recommendations for additions to the proposed plan
- A. Implementation programs
- B. Comments on rare species
- C. Oil development - low development areas

Part III - Text comments
Chapter by chapter review with suggestions for wording changes and appropriate places to add part II recommendations.

Part IV - Summary comments identifying aspects of the plan strongly supported by North Dakota Game and Fish Department.

Appendices
- A. Research Natural Area Sites
- B. Biological Special Interest Area Sites
- C. Prairie White Fringed Orchid
- D. Rare Plant Species
- E. Rare Plant Occurrences - Sheyenne River

545 p3

Part I Overview of State Wildlife Management Objectives

The "state of wildlife management art" on the National Grasslands is such that precise relationships between changes in habitat quality and wildlife populations are generally not quantitatively defined. This makes it very difficult if not impossible to establish precise population potentials and objectives for most wildlife species, particularily for small game and non-game wildlife.

Because of commitments to and competition from other surface uses, it is not generally possible to achieve optimum habitat conditions. As a result wildlife populations cannot reach optimum levels and State wildlife management objectives become elusive if not impossible to reach for most species. On multiple use lands it is, therefore, necessary from a state's perspective to manage most species in terms of desired population trends and maintenance of certain stable minimum populations and habitat conditions.

With the exception of certain limited big game species for which quantitative populations objectives can be established, the practical objectives of wildlife management become largely a matter of improving general habitat conditions where feasible. On the National Grasslands where management is almost entirely geared to maintaining native vegetation, this translates to finding ways of reducing adverse impacts of other resource activities. If satisfactory mitigation can be accomplished natural production potentials can be approached and in general wildlife management objectives will be achieved.

Past wildlife management on North Dakota National Grassland Districts has largely been passive. Wildlife and habitat have been regarded as amenity values and managed as by-products of other management programs. In order to move toward an active program, it is necessary to view wildlife and wildlife-related uses as basic resources and manage certain lands and key habitats for enhancement of these basic resources.

In recognition of this situation, the North Dakota Game and Fish Department has identified several general wildlife management objectives that we believe the plan must attempt to accomplish.

1) Providing sufficient residual nesting cover, broadly distributed on an annual basis, to insure reproduction of ground nesting birds.

2) Improving the condition of woodlands and shrublands throughout the grasslands in recognition of the high value of these key habitats to a wide variety of wildlife.

3) Providing sufficient respite from oil development, road building and other disturbances to allow big game and raptor populations to be managed at optimum levels.

4) Retention of the open space natural environment to the maximum extent possible in order to provide a high quality setting for wildlife related recreation.

A

A Although the wildlife management program on the Little Missouri National Grasslands has been one of reaction in the past, the Forest has always considered wildlife habitat and wildlife-related uses as basic resources. The Proposed Forest Plan enforces this commitment to manage for the enhancement of this basic resource through the establishment of specific management areas designed to improve wildlife habitat and wildlife-related uses. The Plan also establishes the need of an increased wildlife budget to move to an active wildlife program on the Forest.

The Proposed Plan attempt to accomplish the objectives that you have stated. The Plan establishes mininum stubble height guidelines for residual nesting cover and establishes a specific management area and direction for woody draws/riparian areas, and roadless areas (Chapter III, Forest Plan). The objective is to rehabilitate all oil and gas impacted areas as soon as possible after the need for the area or facility is terminated (Chapter II, Forest Plan). The Forest will comply with the Endangered Species Act. Part of that compliance is to identify all lands and habitat essential to all T/E species and to provide for the management diretion for those areas (Chapter II and Appendix VII).

545 p 4

5) Rehabilitation of oil impacted lands and long term restoration of the undeveloped character of essentially roadless areas that were impacted.

6) Identification and appropriate management of lands and habitat essential to T/E species, other rare plants and animals, and exemplary natural communities.

While these objectives are not all inclusive and are very general, a commitment to work toward these key objectives through this plan would constitute a major advancement in wildlife management on the National Grasslands. The key to reaching these objectives is to establish an active wildlife habitat management program with specific goals and objectives for each Ranger District.

545 P 5

Part II Recommendations for Additions to the Proposed Plan

Implementation Programs

While the proposed plan offers important wildlife management advances and establishes excellent management sideboards, actual achievement of wildlife goals and objectives will require carefully monitored implementation programs on each district. In communications with the Forest Service during the review period, we have expressed concern that several aspects of the implementation plans were in need of clarification and detail.

The need for additional detail in implementation programs is best illustrated by noting that out of 1100 total pages contained in the plan and EIS only 16 pages directly address implementation (Chapter IV). We recognize that explicit implementation programs are beyond the scope of this planning effort and we support the concept of producing such programs under the "umbrella" of this plan. It is extremely important, however, that the commitment to produce all needed programs be made in the general plan. Development of programs specific to each district will provide the format for the close coordination and cooperation between the Forest Service our Department and other interests needed to solve complex problems at the field level. Without such directives in the plan, district implementation programs will be too highly discretionary and difficult to coordinate.

The primary programs we would like to see mandated under the "umbrella" of the general plan are District Wildlife/Habitat Management Plans. The objective of these programs would be to consolidate wildlife management planning on each district and to translate the general goals and objectives of the Forest Plan into specific projects for specific lands and habitats on each district. The Forest-wide schedules of management practices and monitoring and evaluation requirements are too general to be of real value in establishing district goals. District wildlife programs would be used to define habitat evaluation techniques, implementation schedules and monitoring and evaluation parameters specific to each district.

In our comments on the text of the plan (Part IV) we have pointed out inadequacies in several specific aspects of the monitoring action plan contained in Table IV-2. It is our belief that the detail needed to adequately monitor wildlife habitat improvement projects and district wildlife populations can only be developed through district wildlife programs and continued interagency coordination under such programs.

The second program that we request be provided as an "umbrella" document is a Transportation and Road Management Plan for D-7 and D-8. We are aware that transportation plans for D-7 and D-8 have been produced, and that the road management standards contained in the Forest Plan provide general direction for further road management decisions at the district level. We are concerned, however, that extensive road building on D-7 and D-8 associated with oil development has created special problems in need of further site-specific standards and decision making. In recent years several access problems to Forest Service Lands in D-7 and D-8 have also surfaced. Solutions to these problems need to be developed, incorporated into the district transportation plans and approved as part of the Forest Plan.

B

B Although the Forest Plan will seves as the single land management plan for the Forest, several other documents will need to be developed to give further guidance to management activities or to aid in the implementation of the Forest Plan. These documents or implementation guidelines will be developed under the umbrella of the Forest Plan and be in concert with it. The list of documents provided in Chapter IV is provided as an example of some of types of implementation guidelines that either have or will need to be developed, and is not meant to be all inclusive. Development of wildlife habitat plans or guidelines specific to each District or parts of Districts will be critical to the implementation and monitoring of the Forest Plan.

C

C The Forest Plan provides road construction standards and guidelines in Chapter II and more specific direction in each Management Area (Chapter III). The impacts of road construction of wildlife habitat, the roadless resource, as well as other resources has been analyzed in the EIS (Chapter II). The Plan, EIS, and the planning record also indicate anticipated miles of road construction associated with minerals and timber management activities. The other important decision made in the Forest Plan and analyzed in the DEIS is which areas will be assigned to a Roadless Management prescription. The Forest Plan does not, however, provide site specific direction for project level analysis. Site specific direction regarding road location, construction standards, and whether a road will remain as part of the Forest Transportation System or be closed, will be addressed in implementation guidelines such as Oil and Gas Area Analyses. These analyses will remain an important and necessary part of project level implementation. Pubic input will be requested and documented through the Envriornmental Assessment process.

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In essence, we are requesting that approval of the transportation and road management plans for D-7 and D-8 be deferred to a later date as a separate environmental assessment under the new plan. This would allow time for additional detail to be added and management standards specific to the situation on each district to be developed. This would allow the transportation document to be developed in conjunction with district wildlife management plans.

As noted in our letter of July 15, 1985 on this matter, we believe the Forest Plan should be used to insure that long term road management objectives are more thoroughly considered before approval of the transportation plans for these districts.

C

The third program we would like to see mandated under the "umbrella" of the Forest Plan is a Rare Plant and Animal Species Inventory. The program goals would be to identify rare species occurrences and recommend appropriate land management considerations for occurence sites. At present, the baseline data for rare species is extensive but incomplete. Systematic surveys for these species need to be conducted and may identify sites in need of additional management consideration. While the plan contains various commitments to manage for perpetuation of all indigenous species, it provides no means or obvious directives to identify occurrences. We recommend a direct commitment to initiate this inventory be made in the general plan.

D

At present, the State of North Dakota has no official list of threatened or endangered plants and animals. The framework for establishing such an official list is in place and it is quite probable that during the life of this Plan lists will be instituted. With the establishment of such lists, it will fall to the North Dakota Game and Fish Department to establish a rare species management program in North Dakota.

Upon completion of rare species inventories on the National Grasslands as we have suggested and with establishment of a state rare species program, we believe there would be a mutual need for designation and management of rare species occurrence sites. We do not anticipate significant changes in land management will be necessary to manage these sites. Designation of rare species sites would be used primarily to insure "status quo" management, in other words to define areas where livestock management intensification and oil related construction activities should not take place. We believe this is consistent with general Forest Service policy on rare species.

The Draft Plan currently proposes management area K as an Archeological Special Interest Area (SIA). We suggest that a similar Biological Special Interest Management Area be established in the final plan to designate rare species occurrences. In our text comments we have suggested a management framework and wording for such a management area. Those comments suggest five presently identified sites we believe would be appropriate for designation as Biological Special Interest Areas.

The plan should provide the flexibility, with needed criteria and qualifications, to allow other SIA's to be added during the life of the Plan. We suggest such wording might be most conveniently added in Chapter II part B - Research Natural Areas (RNA). This section could be expanded to address both RNA's and SIA's.

E

D The Forest believes that prior to initiating a Rare Plant and Animal Species Inventory, specific criteria needs to be developed between the State and the Forest to give a common understaning of such terms as rare, sensitive, and unique. The Plan does contain the commitment to perpetuate all indigenous species. The inventory of such rare, sensitive, or unique plants would be identified through project level analysis activities such as range analyses. The Forest will continue to work with the State on the development of definitive criteria for the occurrence of rare species.

E The Forest Direction (Chapter II) and Appendix VII have been expanded to include the plant species identified by the State of North Dakota. The management direction contained in Chapter II (Unique Plants and Animals) provides for the retention of habitat for these species. Mitigation measures that would be necessary will be identifies in project level analysis such as AMP, mineral lease stipulations, and road locations. To identify each site occurrence as a specific management area would be impossible or impractical at best.

F The Final Forest Plan and FEIS also identifies the piping plover as a federally listed T&E species effective January 11, 1986. Chapter II (Forest Direction) and Chapter IV (Monitoring and Evaluation) provide for the continuing inventory needs of all T&E species.

Considering the 10-15 year expected lifespan of the Forest Plan, we believe the inconveniences of adding biological SIA considerations in the final plan is justifiably appropriate and necessary. We do not believe this addition will significantly alter or conflict with proposed plan directives for other resources. It is our view that rare species inventories and SIA designations are necessary to fulfill natural resource management responsibilities on these uniquely important wildlife lands. E

In support of these suggestions and as additional information, we are including here the following rare species comments:

Comments on Rare Species

The Forest Service Manual identifies and sets planning guidelines for three categories of rare species. The three are endangered, threatened and sensitive. The Draft Forest Service Plan identifies a fourth category for the Custer National Forest called "unique". Each category and the species of concern are discussed below.

I. Endangered and Threatened Species

A. Animals

The Draft forest Service Plan recognizes five federally listed endangered and threatened animal species that may occur on the Custer National Forest in North Dakota. These species are the black-footed ferret, bald eagle, interior least tern, peregrine falcon, and the whooping crane. The management considerations given to endangered and threatened animals in the Forest Service Plan appear to be adequate. However, inventory of these animals and their potential habitats should be continued in order to monitor any changes that may occur on the Custer National Forest in North Dakota. F

B. Plants

Endangered Plants

There are no federally listed or proposed species of endangered plants in North Dakota. Accordingly, no plants have been nominated for the endangered category.

Threatened Plants

There are two plant species, Ophioglossum vulgatum and Platanthera leucophaea, identified as threatened in the Draft Forest Plan.

Ophioglossum vulgatum (adder's tongue fern), although rare from a statewide perspective, is widely distributed in the eastern United States. It is neither a federally endangered or threatened species, listed in the Federal Register as a Category 2 species, or a candidate for future listing. We suggest these species be removed from the threatened category. G

G Your comments concerning the correct status of Ophioglossum vulgatum and Platanthera leucophaea is noted and the corrections made in the FEIS and Final Forest Plan. We have retained the latter as a T&E plant species with a note as to its current status.

5458

Platanthera leucophaea is listed in the Federal Register as Category 2 species, meaning that while the evidence available at the time the November 23, 1983 Federal Register went to press suggested the species was threatened or endangered, the U.S. Fish and Wildlife Service felt more information was needed before a final determination could be made. To date status reports have been prepared for the majority of the states falling within Platanthera leucophaea's historical range. These status reports (with the exception of one which refrained from making a recommendation), universally recommended the species be considered for federal listing. A single regional status report covering the remaining states (including North Dakota), is now in preparation. This report will be completed by midwinter.

Although the species perhaps more appropriately belongs in the sensitive category, we support the Forest Services decision to consider Platanthera leucophaea threatened, for the following reasons: all but one of the completed status reports strongly recommended and documented the need for listing; the last of the status reports is nearing completion; the Sheyenne National Grassland harbors the largest occurrence known; and, the ongoing and planned management of the Grasslands poses a potential threat to the species. Appendix C contains specific information on the population of Platanthera leucophaea occurring within the Sheyenne National Grasslands. We also recommend that the Forest Service give consideration to this species in the final EIS and Forest Service Plan. Specifics requiring consideration include a framework for assessing existing and potential impacts on the species.

G

II. Sensitive Species

A. Animals

Under the sensitive species category, only the Dakota Skipper is listed for the Custer National Forest in North Dakota. Very little information on the species in North Dakota is available at this time. This lack of basic knowledge suggests that further study is necessary

H

B. Plants

We recommend Eriogonum visheri, Cypripedium candidum, Eleocharis wolfii, Rorippa calycina and Erigeron radicatus be listed as sensitive species. All are extremely rare throughout their range or have extremely limited distributions, and have been documented from North Dakota. Information on these is being forwarded to the Custer National Forest under separate cover.

I

III. Unique Species

The Draft Plan recognizes nine species of plants as unique. Three are not rare in North Dakota as cited. We recommend that these three: paper birch, dwarf birch, and false yarrow be dropped from consideration as unique species.

H The Final Forest Plan retains this species as a sensitive species. See Appendix VII to the Forest Plan.

I The Final Forest Plan (Appendix VII) has been expanded to include the following plants as Sensitive species: Eriogonum visheri, Cypripedium candidum, Eleocharis wolfii, Rorippa calycina and Erigeron radicatus.

Appendix VII to the Forest Plan has also been expanded to include those plants cited in Tables I and II as being unique species. The Forest will retain paper birch, dwarf birch and false yarrow as unique species. These species while perhaps not rare in North Dakota are limited in their distribution on lands administered by the Custer National Forest.

As previously stated, the Forest will coordinate with the State on developing the criteria for sensitive, rare, and unique species. This criteria will serve as the guideline for adding to or deleting species from the initial inventory.

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We recommend that species in the attached tables also be recognized as unique and be added to the list of known species of concern. All are significant on a statewide basis and have been found in southeastern or southwestern North Dakota in habitats similar to those on Forest Service lands. Approximately one-third have been documented from Forest Service lands. These are listed below and summarized in Appendix D. The remainder have been collected from surrounding counties. Detailed information on all of the species is on file and is available upon request. The species we are recommending are segregated into two tables (I and II) to facilitate consideration at a district level. Table I is applicable to the districts in western North Dakota. Table II applies specifically to the Sheyenne Ranger District.

Twenty-four of the species listed in Appendix D have been documented on Forest Service lands. They are (in alphabetical order): Aster sericeus, Astragalus gracilis, Athyrium filix-femina, Campanula aparinoides, Carex leptalea, Cypripedium reginae, Dryopteris cristata, Dryopteris spinulosa, Equisetum palustre, Galium labradoricum, Gymnocarpium dryopteris, Helianthemum bicknellii, Hypericum boreale, Liparis loeselii, Menyanthes trifoliata, Onoclea sensibilis, Ophioglossum vulgatum, Phlox alyssifolia, Physaria brassicoides, Pinus flexilis, Populus balsamifera ssp. trichocarpa, Pycnanthemum virginianum, Ribes inebrians, and Salix pedicellaris.

I

Appendix E contains specific information on the riparian areas along the Sheyenne River managed by the Forest Service. Several of these harbor a unique and fragile flora. We recommend that activities in these areas be directed so as to maintain the riparian habitat and viable populations of the rare species associated with it.

J

IV. Animal Species of Special Concern

An excellent source of information pertaining to species of limited occurrence in North Dakota is the North Dakota Chapter of The Wildlife Society's report entitled Endangered and Threatened Biota of North Dakota. This report was supplied to the U.S. Forest Service in June 1982 by our Department as part of our intial input to the planning data base. At this time, it appears the Draft Forest Service Plan provides adequate management considerations for species of special concern that are listed in The Wildlife Society's report, but are not federally listed as endangered or threatened.

In addition, the Forest Plan also appears to provide a mechanism for management modifications through the development of district wildlife plans and AMP's. Modifications may be necessary as a result of additional data that would specifically identify areas on the Custer National Forest as essential habitat for species of special concern. Following identification of essential habitats, we do not anticipate major management alterations would be necessary in order to maintain viable populations of limited occurence wildlife.

K

J The Forest Plan has identified certain areas along the Sheyenn River as uniques or as having sensitive plants. These areas will be evaluated for inclusion in the RNA system. Other areas directly adjacent to the Sheyenne River have been included in Management Area M. The goal of this management area is to emphasis the riparian value associated with the Sheyenne River.

K No response is necessary.

545 p/0

Table I. Rare plant species documented from the Medora, McKenzie or Grand River Ranger districts on the surrounding North Dakota counties

Agrostis exarata
Astragalus aboriginum
Astragalus drummondii
Astragalus gracilis
Astragalus vexilliflexus
Carex foenea
Carex scirpoidea
Carex umbellata
Cheilanthes feei
Chenopodium subglabrum
Clematis columbiana var. tenuiloba
Collinsia parviflora
Coryphantha missouriensis
Erigeron divergens
Erigeron ochroleucus
Fritillaria pudica
Leucocrinum montanum
Madia glomerata
Mentzelia pumila
Oxytropis sericea
Phlox alyssifolia
Physaria brassicoides
Pinus flexilis
Polygonum leptocarpum
Populus balsamifera ssp. trichocarpa
Potentilla diversifolia
Potentilla tridentata
Psoralea tenuiflora
Ribes inebrians
Smilax ecirrhata
Sporobolus airoides
Stephanomeria runcinata
Stephanomeria tenuifolia

Table II. Rare plant species documented from the Sheyenne Ranger District or surrounding counties

Acorus americanus
Agrimonia gryposepala
Apios americana
Asclepias sullivantii
Aster sericeus
Athyrium filix-femina
Botrychium lunaria
Campanula aparinoides
Cardamine bulbosa
Carex convoluta
Carex disperma
Carex formosa

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Carex lasiocarpa var. americana
Carex leptalea
Carex richardsonii
Carex umbellata
Caulophyllum thalictroides
Cuscuta cuspidata
Cypripedium reginae
Cyperus rivularis
Dicentra cucullaria
Dryopteris cristata
Equisetum palustre
Equisetum pratense
Eragrostis spectabilis
Eriophorum gracile
Eriophorum viridicarinatum
Euonymus atropurpureus
Gymnocarpium dryopteris
Helianthemum bicknellii
Hudsonia tomentosa
Hypericum boreale forma callitricoides
Lechia stricta
Liparis loeselii
Menyanthes trifoliata
Najas marina
Onoclea sensibilis
Ophioglossum vulgatum
Phlox pilosa
Pycnanthemum virginianum
Ranunculus recurvatus
Ribes cynobasti
Salix pedicellaris
Sanicula gregaria
Senecio tridenticulatus
Sicyos angulatus
Solidago flexicaulis
Solidago riddellii
Viola conspersa

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Oil development - low development areas

The level of oil development that is authorized by the proposed plan remains an area of great concern to our Department. Based on the responses we have received during the review period concerning the reductions of roadless areas we believe our concerns are widely shared in North Dakota.

The plan does propose to increase impact reduction measures and provides qualified protection for some very important wildlife lands. In general, this creates a substantial advancement over past mineral management. Other than these conditions, however, the plan does not place an upper limit on the amount of oil development, road building, and, hence, overall impact that may occur. Even for limited "protected" lands there is a possibility of development because of existing leases and the potential need to protect the federal mineral estate from drainage by adjacent private development.

In very rough terms we estimate that 90-95% of the federal lands on D-7 and D-8 are available for development. While we do not anticipate this level of actual development, it is none-the-less a disconserting possibility. We question whether such a total development level would be consistent with the primary purposes for which these lands are administered; and it does not appear the plan or EIS have fully analyzed the potential effects of full scale development. Because the plan provides no visible mechanism for additional limitations, it is in many ways reminiscent of the 1974/75 plans with regard to oil development impact potential.

Because of existing leases and production, we realize there are few real opportunities to further limit oil development outside of essentially roadless areas (ERA's). We have been informed by the Forest Service that the potential for development under the current plan cannot be accurately predicted. Only in ERA's on leases that are not held by production, could maintaining NSO stipulations be used to hold undeveloped lands in trust until a further date when total development potential can be more accurately assessed.

Since considerable concern has been expressed over reductions in Essentially Roadless Areas, continued protection of undeveloped ERA's would seem to be at least a partial answer to both placing an upper limit on development and providing maximum possible retention of ERA's.

We, therefore, urge the Forest Service to include in Management Area J those undeveloped portions of Magpie Creek, Ash Coulee, Twin Buttes/Wannagan and Strom-Hanson essentially Roadless Areas that are not proposed for Management Area C. It appears all of these ERA's contain contiguous parcels of 5,000 or more acres that would contribute importantly to previously described objectives for low development management. NSO stipulations should be retained on these parcels.

L

L. The level of oil and gas development and the potential for impacts on other resources remains one of the major issues for the Custer National Forest and our publics. This issue as it relates to the management of roadless areas generated more public responses to the Draft Forest Plan and EIS than any other issue. In response to the public comments, the Forest completed additional analysis of management options as they relate to minerals management within roadless areas. The criteria analyzed were mineral ownership, surface ownership patterns, lease status, and mineral potential. The Forest also considered the public support for roadless areas. The Final Forest Plan and FEIS recommends three additional areas or approximately 30,000 to be managed for Low Development (Roadless) management. This would result in approximately 44,000 acres of the 120,000 in North Dakota remaining in a "low development" status. The remaining undeveloped portions of Magpie Creek, Ash Coulee, Wannagan, and Strom Hanson will remain in various other management areas.

In addition, the Forest Plan increases the mitigation measures to protect other basic resources such as wildlife habitat (Limited Surface Use Lease Stipulation, Appendix V). Depending on how one defines the term "development", 90-95% of the Little Missouri National Grasslands could be "developed". While a major portion of the area is leased, potential development is generally limited by surface occupancy stipulations. In some areas that have been heavily impacted only 4%-5% of the surface acres have experienced direct impacts.

The Proposed Plan is consistent with the legislative mandate of the Forest Service. Although the Little Missouri National grasslands were acquired under the Bankhead-Jones Farm Tenant Act, the management of these lands are mandated by numerous multiple use laws such as the National Forest Management Act (NFMA) and the Multiple-Use/Sustained Yield Act. The Mining and Minerals Plicy Act of 1970 declares that is is the continuing policy of the Federal Government to foster and encourage private enterprise in the development of a stable domestic minerals industry and the orderly and economic development of domestic mineral resources.

545 pt p13

Part III Text Comments

Following are comments on the text of the proposed management plan, suggestions for wording changes and suggestions on appropriate places to add Part II recommendations.

CHAPTER II

A. Goals

Overall, we believe the goal statements are excellent and provide clear direction for various resources and lands. Our specific comments on the goals, as numbered in the Plan are as follows:

2. The goal for prairie dog management is essentially a statement of control that proposes to maintain populations at or very near a historic low. Our objection to this goal statement is based more on its disguised nature than its substance. However the relationship of prairie dogs to the endangered blackfooted ferret is down played and we believe not sufficiently addressed. — M

4. Past leasing policies and a lack of adequate stipulations have created many problems on the Little Missouri National Grasslands. A concurrent goal of minerals management should be, and based on the plan apparently is, to bring leases up to proposed standards and to correct wherever possible resource conflicts created by past leasing actions. We suggest a statement to this effect be contained in this goal. — N

5. Excellent goal - a badly needed, overdue recognition of the special management importance of these key habitats. — O

6. We suggest the goal also be to enhance the quality of key wildlife and fisheries habitat. With this addition, based on the management considerations incorporated into various management areas, we feel this is an adequate goal statement. — P

B. Objectives

1. Resource/Activity Summaries

   b. A long term objective of rehabilitating and restoring low development and roadless characteristics in oil impacted areas should be included here. — Q

   c. We strongly support the objective of establishing an active habitat management program on the National Grasslands in North Dakota. — R

3. Research Natural Areas (Add: Special Interest Areas).

   There is one existing Research Natural Area, one Candidate RNA, and one Proposed RNA in the Draft Forest Plan. We suggest boundary clarification for the existing RNA, and a framework for setting and meeting RNA targets in North Dakota. In addition, we suggest an MOU between the U.S. Forest Service and North Dakota Parks and — S

M The Forest Plan establishes acreages of prairie dog towns by Ranger District. The objective is to manage for the continued existence of this species on the Forest. It is recognized that the acres of prairie dog towns managed for in the Forest Plan does not meet the requirements of size and distribution as set forth by C. Hilman as necessary to support a population of black-footed ferrets over time (Chapter II, EIS). All prairie dog towns are considered possible black-footed ferret habitat, and surveys to determine their existance will be made prior to control and/or any surface disturbance activity. (Chapter II, Management Plan). The Forest will continue to work with the State and the Fish and Wildlife Service in developing management strategies for the recovery of the ferret.

N The Forest realizes that some current mineral leases do not contain adequate lease stipulations. For the most part, the Forest has been able to mitigate adverse impacts to other resources through negotiation and cooperation with industry. When new mineral leases are issued, they will contain the lease stipulations to reflect the goal for that particular management area and also to protect the basic resources (Chapter III, Management Plan). Each lease must be considered on a case-by-case basis.

O No response is necessary.

P This management goal has been modified to reflect your concern.

Q This portion of the plan has been modified to include the objective of rehabilitating areas impacted by oil and gas activities.

R No response is necessary.

S The boundaries to the proposed RNA's in North Dakota will be established through the RNA evaluation process. Establishment of boundaries at this time would be somewhat arbitrary due to the lack of data for some areas.

The Forest is willing to discuss an MOU with the State of North Dakota concerning recognition of RNA's or SIA's through the State Nature Preserve Program. It may be possible to include this consideration in the existing MOU with the State. Prior to agreeing to an MOU for this, the Forest would have to know the management implications associated with the State Nature Preserve Program.

The discussion of RNA's in Chapter II and in Management Area L (Chapter III, Forest Plan) has been expanded to include the five special areas identified in Appendices A and B on your letter.

545 p14?

Recreation Department regarding recognition of RNA's and SIA's through the North Dakota Nature Preserve Program. In order to implement designation of existing sites and meet RNA targets in North Dakota, the North Dakota Game and Fish Department will assist the Forest Service RNA Committee in the writing of reconnaissance and establishment reports, as well as participate in any necessary field surveys. S

Individual sites are described in Appendices A and B. Recommendations to meet these objectives are made under management areas K & L.

RNA Targets

The U.S. Forest Service-Northern Regional Plan (1981) reiterated the RNA mandate, stating:

"In each Regional analysis area, establish sufficient research natural areas so that two or three examples of each major forest habitat type and one example of each minor forest habitat type that occur in each analysis area are represented. Establish one example of each shrubland and grassland habitat type and one example of each aquatic ecosystem type."

A habitat type enumeration has been developed for Custer National Forest. The Draft Plan assigns habitat type targets across the various districts. Omitted are the majority of forest and non-forest types found in North Dakota. Efforts to correct this shortage of classification tools for filling the mandate in North Dakota have been made by the Rocky Mountain Forestry and Range Experiment Station.

It will be possible to fill some, but not all of the targets for the Little Missouri National Grasslands within undeveloped areas of Theodore Roosevelt National Park, given interagency coordination.

Research Natural Areas of the U.S. Forest Service fit the general standards of candidate Natural Preserves as described in the State Natural Preserves Act (NDCC 55-11). It would be appropriate for RNA's to be officially recognized among the state's significant Nature Preserves, a recognition which requires articles of dedication. The MOU suggested between the Forest Service and the North Dakota Parks and Recreation Department regarding natural area designation and consultation could establish the framework for this cooperative effort. T

4. Additional Data Requirements and Accomplishment Schedule

The need to complete inventory and designation of RNA's should be added. Data level would be regional standards and the activity would be ongoing. Inventory of rare species occurences is also an existing data need that should be included in this schedule. U

T Reference response to your comment S above.

U Agree. This has been added in the discussion on Additional Data Requirements and Accomplishment Schedule in Chapter II, Forest Plan.

545 p15

C. Research Needs

2. What are the anticipated demands for grassland wilderness, and what are the size and quality requirements for same?

3. We have identified two wildlife research needs that we believe should be documented in the Forest Plan.

   - Habitat requirements for elk on the LMNG with emphasis on defining conflicts and compatibilities with livestock.

   - A similar study of bighorn sheep habitats and interactions with domestic livestock.

V

E. Management Standards

4. Fish and Wildlife

b. Threatened and Endangered (T&E)

4) Does the U.S. Fish and Wildlife Service feel that this plan provides sufficient flexibility to maintain critical habitat in case of an unexpected ferret discovery?

W

d. Unique Plants and Animals

Revise lists according to rare species comments.

X

e. Overall, an excellent and very thorough set of general management standards.

4) Add: Sage grouse and sharptail grouse - avoid disturbing activity within ¼ mile of active grounds - March 1 - June 1.

Y

f. Prairie Dog Management

The plan should contain, if it does not, a provision to maintain a certain minimum number of dog towns on <u>each</u> district as well as acreages.

Z

5. Range

c. Range Analysis and Allotment Management Planning

The wildlife considerations included in these programs should allow conflicts to be identified and establish the general direction needed to begin a cooperative resolution of significant problems.

AA

d. Range Improvements

b)(1) - The entire range management program leans very heavily on structural range improvements as the means of both resolving

BB

V The section on Research Needs in Chapter II, Forest Plan has been expanded to include research needs for elk and bighorn sheep on the Little Missouri National Grasslands.

The anticipated demand for wilderness is not research in the truest sense but is more appropriately viewed as a public issue. The Monitoring and Evaluation Plan (Chapter IV, Forest Plan) establishes a methodoly for evaluation the resolution of current or emerging issues for the Forest. See Monitoring Item H1 and H2 (Chapter IV, Forest Plan).

W The U.S. Fish and Wildlife Service has rendered a No Jeopardy Opinion for all T&E species on the Forest in response to the Forest's request for formal consultation on the Draft Forest Plan and EIS. A copy of the Forest Biological Evaluation and the complete response of the Fish and Wildlife Service is included as an appendix to the FEIS.

X Reference is made to the responses for Comments G and I above.

Y Prairie grouse have been added to the list of key species/critical timing periods in Chapter II, Forest Plan. Based on the analysis and literature, the critical timing period for limiting ground disturbing activities for nesting is March 10-May 15.

Z The Forest Plan contains a provision to maintain a minimum number of acres of prairie dogs for each Ranger District (Chapter II, Forest Plan). It is not the intent of management to maintain a specific number of prairie dog towns on each district, but to manage for this species over time and space (distribution).

AA No response is necessary.

BB The discussion of range improvements has been expanded in the Final Forest Plan to answer your concern. The Forest Plan does not attempt to quantify every range improvement needed to implement allotment management plans (AMP's). These improvements are part of the project level analysis that will take place in implementation and they will be developed as part of each AMP.

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wildlife habitat conflicts and increasing livestock production. The plan does not, however, specify the improvements to be made or the basis on which it is assumed these objectives can be reached. We believe it, therefore, essential that this provision be strengthened. We suggest "will be considered" be changed to "will be incorporated into structural range improvement projects as consistent with management area goals." BB

6. Watershed, Air Quality

   b. Air Quality

      Excellent standards. We encourage and support efforts to bring the H_2S problem on the LMNG into compliance with these standards. CC

8. Minerals and Geology

   b. 2) We assume that facilitation of oil and gas exploration and development through cooperation with industry includes seeking their cooperation in avoidance of protected and non-protected critical wildlife areas. Because many older leases do not contain stipulations to protect certain habitats and areas identified in this Plan, the U.S. Forest Service should seek cooperative agreements with industry to add needed stipulations and achieve voluntary compliance with plan directives. DD

11. Facilities

   a. Transportation

      1) As suggested in our letter of July 15, 1985, we believe additional standards specific to D-7 and D-8 should be added as item g) in this portion of the plan.

      We suggest the following wording:

   g. On the Little Missouri National Grasslands (D-7, D-8), because of extensive road construction for oil and gas development, the following additional management standards will be implemented. These additional standards will be used as guidelines in the formulation of a detailed transportation and road management plan for this portion of the Forest.

      1) Roads constructed for the primary purposes of oil and gas development within the 13 essentially roadless areas (ERAs) as designated in the 1974/75 plan will be removed, closed or down graded to primitive standard where feasible and reasonable at such time as oil activity declines or ceases and higher standard roads are no longer needed.

      2) Forest System roads that have been upgraded or are proposed for upgrading from primitive to commercial standard for the primary purposes of oil development will not necessarily be retained or maintained at commercial standard subsequent to decline or EE

CC No response is necessary.

DD The Forest is aware that some of the older mineral leases do not contain appropriate stipulations. The Forest will continue its on-going policy of negoiating with the industry to seek voluntary mitigation of potential adverse effects. This section has been strengthened in the Final Forest Plan.

EE This suggestion has been incorporated in the Final Forest Plan in Chapter II, Section 11, Transportation Facilities. Reference is also made to the response to Comment C above.

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cessation of oil activity. Forest Systems roads to be retained at commercial standard will be specifically identified in the road management plan. Decisions on retention and maintenance of all other Forest System roads will be made on a case by case basis when upgrading is proposed. Performance bonding and/or legal instruments needed to insure road reclamation or down grading will be obtained at the time upgrading is approved. EE

CHAPTER III

Management Area A

B. Goal

..."While striving to improve wildlife habitat" is a very weak wildlife goal statement. We suggest, and to improve wildlife habitat through intensive range management with emphasis on key wildlife habitats and species, be substituted. FF

D. Schedule of Management Practices

According to our calculations, 500 acres of brush control per year projected over ten years could potentially allow 5,000 acres or over 7% of the total land on the Sheyenne to have brush control. While certain wildlife constraints are built into brush management standards, there is probably not over 5,000 total acres of brush on the Sheyenne. We have strong objections to such an extensive control program. Perhaps this issue should be clarified in the final under timber management standards. GG

Management Area B

C. Management Standards

3. b. Range

Management of this area relies heavily on structural range improvements as the means of increasing livestock production and reducing conflict with key wildlife habitats. Our previous comments on structural improvements are applicable here. HH

5. Minerals and Geology

b. 3) Is the wording correct pertaining to the estimated area affected by limited surface use stipulation? As it reads this statement gives the impression that the LSU stipulation plus other restricted areas will total 10,000 to 15,000 acres. II

250

FF The goal for this management area has been rewritten.

GG The management activity of Brush Control for Management Area A is more appropriately entitled Brush and Forb Control. Most of this management practice will be the control of the forb golden rod. The Forest estimates that only 100 acres of brush control will be accomplished annually. The schedule of Management Practices for this management area has been revised.

HH The discussion of range improvements has been expanded in the Final Forest Plan to answer your concern. The Forest Plan does not attempt to quantify every range improvement needed to implement allotment management plans (AMP's). These improvements are part of the project level analysis that will take place in implementation and they will be developed as part of each AMP.

II The area affected by the Limited Surface Use stipulation is estimated at 10,000-15,000. This is in addition to areas affected by other mineral lease stipulations. This has been clarified in the Final Forest Plan (Management Area B, Chapter III).

545 p18

Management Area C

B. Goal

This is an excellent and appropriate goal statement for these critical big game areas. We strongly support the key wording contained in the last two sentences and urge retention of this clear direction as is. JJ

C. Management Standards

b. Implementation plans should also consider cooperative management agreements with other federal and state agencies and adjacent private landowners. Except for this ommission, we believe that these are excellent management standards and support their approval as is. KK

Management Area D

B. Goal

Again, the key wording in this statement is contained in the final sentence. We support the commitment to resolve conflicts that cannot be successfully mitigated in favor of wildlife. We believe such a commitment is fundamental to implementing appropriate management in this area. This statement must be retained in the final plan for our concurrence. This fact cannot be over-emphasized! LL

C. Management Standards

2. Fish and Wildlife

These are very good management standards. They set excellent general objectives and provide the direction to develop implementation plans with the flexibility to incorporate site-specific considerations. MM

3. Range

Again, these are very good management standards. This should allow range and wildlife objectives to be cooperatively attained through AMP's. NN

6. Minerals

The terms and conditions under which oil development can take place should allow adequate protection of wildlife resources. We strongly support the leasing plans for the Tracy Mountain-Kinley-Bullion area. We believe this is the major provision in the plan for maintaining the open space natural environment needed for optimum quality wildlife related recreation. We also strongly support the lease stipulations and activity timing provisions proposed. We recommend this section be approved as is. OO

JJ No response is necessary.

KK This management standard has been modified to address your concern.

LL The wording of the goal statement for Management Area D has been changed slightly in the Final Forest Plan. However, the essence of the emphasis of management for this area remains the same--to maintain or improve the long-term diversity and quality of habitat for wildlife.

MM No response is necessary.

NN No response is necessary.

OO No response is necessary.

543 p11

Management Area E

B. Goals

The very strong and clear commitment to develop mineral resources in this management area will create conflicts with wildlife resources, but it does at least "clear the air" compared to the unclear, arguable situation that has existed. We suggest the following addition be made to the second sentence "...and, on a limited basis, through special lease stipulations where necessary to manage key surface resources." We believe this addition or a similar statement is needed to reflect the leasing standards that are proposed. PP

C. Management Standards

5. Minerals and Geology

a. 2) f) Methods to speed up the permitting process do not appear warranted in light of onshore leasing order #1. At present the time frame for adequate identification of resource conflicts and the development of mitigation measures and alternative access routes are very limited. QQ

b. Given that development is going to take place in this management area, the most controversial aspect of planning will be access routes. In addition to facilitating timely and economic development, this statement should also contain the objective of minimizing impacts to key wildlife habitats and undeveloped badlands canyons. Overall, we believe this will not be a major problem. We are concerned, however, that in areas such as Magpie Creek-Ash Coulee, road development without this consideration would lead to unnecessary, excessive impacts. In areas such as these, we believe certain "inefficiencies" in transportation planning are necessary and appropriate to achieve compatability with the primary purposes for which National Forest lands are administered. RR

252

Management Area J

We strongly support low development (roadless) area management. We believe the goal and standards proposed provide appropriate management for these areas. As per our earlier comments we suggest undeveloped ERA's be retained NSO and added to management area J. SS

Management Area K (Special Interest Areas)

As per our previous comments and discussions with the Forest Service, we recommend that one additional management area be included in the final plan. Because this area would provide management for Biological Special Interest Areas, our comments and recommendation for this additional management area are included here. TT

In the FEIS for the Badlands Planning Unit and Rolling Prairie Planning Unit of the Little Missouri National Grasslands, 1974 and 1975, respectively, the need for developing an administrative classification for relict areas,

PP The proposed addition to the management goal for this Management Area has been incorporated into the Final Forest Plan (Chapter III, Management Area E).

QQ Having the area analysis completed is probably the most limiting factor in responding to potential mineral activity in a timely manner. The area analyses will be used in implementing the broad direction established in the Forest Plan. Our publics can be better informed and better management decisions can be made by identifying such things as transportation needs, and potential resource conflicts early in the process. It is not the intent of this management area to "short change" the decision making process by speeding up the permitting process.

RR The use of the Limited Surface Use Stipulation in mineral leases will protect the heads of canyons or canyons complexes critical for wildlife. The Forest realizes that the most economically efficient transportation system is not always the best when all resources are considered. Where appropriate, the Forest will continue to use a disconnected transportation system.

SS The Final Forest Plan and FEIS recommends three additional areas (Twin Buttes, Long X Divide, and portions of Horse Creek) or approximately 18,000 to be managed for Low Development (Roadless) management. This would result in approximately 30,000 acres of the 120,000 in North Dakota remaining in a "roadless" status. The remaining undeveloped portions of Magpie Creek, Ash Coulee, Wannagan, and Strom Hanson will remain in various other management areas.

TT The Forest has chosen to include the five special areas mentioned in your letter in Management Area L, Research Natural Areas. These areas have been identified as possible future candidates for RNA designation. Size, boundaries, and special features/species will be documented through the RNA procedure (Reference Chapter II, III Management Area L and Management Area S).

545 p 20

peripheral species and unusual vegetation areas was cited. Most of these areas do not fall within the realm of RNA criteria, but fit within the broad SIA definition. They are not addressed in the current Draft Plan. Therefore, a management area designation is needed for Special Interest Areas of botanical and zoological significance.

Blue Buttes is proposed in the Draft Plan as an Archeological Special Interest Area. There are no other proposed or existing SIA's. We suggest an additional five Biological SIA's under a separate management area category. In addition, we again suggest an MOU between the U.S. Forest Service and North Dakota Parks and Recreation Department regarding recognition of SIA's and RNA's through the North Dakota Nature Preserve Program. The North Dakota Game and Fish Department will assist in any necessary surveys or documentation.

Following is our suggestion for wording of the management framework for Biological Special Interest Areas. Individual sites are described in detail in Appendix B.

Biological Special Interest Areas - ADDITIONAL MANAGEMENT UNIT TT

A. This management area includes candidate Biological Special Interest Areas. The need for developing an administrative designation for such areas was cited in the FEIS of the Management Prescription for the Badlands Planning Unit (1974; p. 50). These areas are recommended for classification as Special Interest Areas under section 36 CFR 294.1 and FSM 2362.

Name and Description	RD	Acres
Black Cottonwood Botanical Area	Little Missouri	10 minimum

This nominated SIA contains a disjunct stand of Black Cottonwood which may be the easternmost occurrence of this variety throughout its range.

Bullion Butte Escarpment Biological Area	Little Missouri	600 minimum

This nominated SIA contains escarpment habitat for rare raptors and a rare plant.

Columnar Juniper Biological Area	Little Missouri	40 minimum

This nominated SIA contains the only persisting and naturally occurring subterranean burning coal vein, plus the only known stand of Rocky Mountain juniper that has developed a columnar growth form as a result of burning coal vapors. In the area are three rare plant and animal species and striking wind-eroded sandstone formations.

545 p21

Denbigh Experimental Forest Botanical Area 40-120

This nominated SIA contains primarily mixed grass prairie on rolling sand plains that has been protected from grazing since the Dust Bowl era, lying within a section of extensive tree plantings.

Ice Caves Biological Area Little Missouri 20-80

This nominated SIA contains one of the few caves in North Dakota.

B. Goals

To protect and, where appropriate, foster public use and enjoyment of areas with botanical, zoological, and scenic resources. Conflicts that cannot be successfully mitigated will be resolved in favor of preserving these resources.

C. Management Standards

1. Recreation

   a. Passive recreation use will be allowed unless in direct conflict with perpetuating the features of primary significance.

   b. Protect the scenic value of the area of concern recognizing that the impact of some existing uses can be mitigated but not all can be eliminated.

   c. The area will be closed to off-road vehicle use to protect the scenic and other values of the area. Local landowners and permittees will be given a continuing permit for access.

   d. The established Biological Special Interest Areas of North Dakota will be nominated for North Dakota Nature Preserve designation by the North Dakota Parks and Recreation Department. Articles of dedication will be drawn up. The Biological Special Interest Areas may be publicized.

2. Wildlife and Fish

   Wildlife habitat improvement projects will not be permitted in this area, except to meet the needs of approved projects associated with the management of the Biological Area.

3. Range

   Range management will be consistent with the needs of the primary features of biological significance, and addressed in the allotment management plan (AMP).

TT

545p22

4. Timber

Timber harvest will not be permitted except to meet the needs of management projects which help maintain or enhance the primary features of biological significance.

5. Minerals and Geology

a. Surface disturbances expected from geophysical operations will be minimized to reduce the risk of impacting or destroying biological and scenic values.

b. As leases expire or terminate, the designated Biological Areas will not be recommended for re-leasing or will contain a No Surface Occupancy stipulation.

C. Facilities

a. Roads not needed for permanent access will be closed and rehabilitated.

b. Energy/utility corridors will be avoided in this area.

c. Fencing will be permitted if needed to protect the area.

TT

D. Schedule of Management Practices

Activity	Decade 1 (Average annual)	Decade 2 (Average annual)
Range Management - Noxious Weed Control	5	5

E. Monitoring

At least 12 monitoring items can be applied to this area. These monitoring items are forest-wide in nature (Table III at the end of this chapter). Evaluation criteria are displayed in the Monitoring Action Plan (Chapter IV, Table IV-1).

Management Area L (Research Natural Areas).

A. Description

After Two Top - Big Top under Acres substitute: 100. For the description substitute: This RNA represents a perched relic prairie in North Dakota with the following habitat types: Western wheatgrass, Needle-and-thread - Junegrass and a localized Big Sage type in addition to Badlands slope communities.

UU

Replace and combine River Ecosystem and Beaver Ponds names with: Sheyenne Terraces. For the descriptions, substitute: This candidate RNA in North Dakota contains the following habitat types:

545 p 23

American elm-Green ash and Bur oak, as well as river and wetland communities in an area fed by springs. UU

B. Goals

Revise this section to read,
To represent natural systems and accompanying natural processes in unmodified condition for research, study, observation and monitoring. VV

C. Management Standards

Add j. The established Research Natural Areas of North Dakota will be nominated for a North Dakota Nature Preserve designation by the North Dakota Parks and Recreation Department. Articles of dedication will be drawn up. Research Natural Areas will not be publicized. WW

3. Range

Management guidance is given in the Forest Service Manual with respect to livestock grazing, which is to be restricted to those areas where it is essential for the maintenance of specific natural vegetation types.

The language in the Draft Plan is such that livestock use may be interpreted as conflicting with these directives. Livestock grazing should be considered a valid practice on RNA's when natural disturbance processes cannot otherwise be maintained.

We suggest the following revision be made:

Where grazing by large ungulates has occurred prior to settlement, grazing by domestic cattle may be considered among the options for mimicking natural disturbances when these disturbance processes cannot otherwise be maintained. Noxious weeds may be controlled to prevent their spread into or within the area. Only hand treatment will be permitted. XX

Management Area M

Excellent management prescription. We suggest no significant changes be made and urge inclusion of this area as is in the final plan. YY

Management Area N

We assume that hardwood draws on the Sheyenne National Grasslands other than the Oak Savanna and identified riparian woodlands are included in the management area. That being so, we strongly support this management area proposal and suggest no significant changes be made. ZZ

UU The additions in your comment have been included in the Final Forest Plan (Chapter III, Management L).

VV As stated in the Draft Forest Plan, this goal accurately reflects the goal of management for this Management Area.

WW The Forest considered this proposed addition to the management direction for RNA's but chose not to include it in the Final Forest Plan. As previously stated, the Forest is uncertain at this time what management implications would be associated with designating RNA's as North Dakota Nature Preserves. However, the Forest would certainly entertain a discussion with the State concerning their proposal.

XX This suggested change in wording has been incorporated in the Final Forest Plan.

YY No response is necessary.

ZZ The woody draws on the Sheyenne Ranger District are a part of Management Area N. As noted, however, the general oak savanna on this District is not included in Management Area N.

545 p24

CHAPTER IV - IMPLEMENTATION

C. Project Planning

Given the very general nature of the plan, we believe detailed management activity programs developed at the district level are essential to implementation. We support the concept of developing such programs under the "umbrella" of this Forest Plan.

In addition to those documents listed, we recommend the following documents or programs be mandated by the plan:

1. Transportation and road management plans for D-7 and D-8.

2. Wildlife management programs in addition to and encompassing those directed for areas C and D for all North Dakota districts.

3. Rare species, special interest areas (SIA) and research natural areas (RNA) inventory program establishing framework for identification of candidate areas and initiation of designation process for appropriate sites.

AAA

D. Monitoring and Evaluation

Table IV-2 - Monitoring Action Plan

Item C-4 and C-5 - wildlife. We question whether a 5% reduction over two years in effective acres is acceptable variability to initiate further evaluation. Our understanding of the overall goal for key wildlife areas is that habitat conditions will be maintained or enhanced and that conflicts with livestock will be reduced. Under this monitoring plan it would appear that effective acres of key habitats could be reduced by up to 5% every two years or a total of nearly 25% over a 10-year planning period without triggering further evaluation.

We recognize the imprecise nature of these variability factors and do not anticipate that anything close to a 25% reduction will occur under the proposed alternative. What this points out is the need to develop under district wildlife programs special objectives, appropriate survey techniques, and variability and accomplishment standards specific to key habitats on each district. The need for district wildlife programs is further pointed to by the inadequacy of current habitat surveys and range analysis techniques to detect 5% changes in habitat conditions.

BBB

Item C-8 - population trends. The fact that reliability of wildlife surveys of the NDG&F are rated low illustrates the need for district wildlife programs that can accurately monitor population trends of these key wildlife species on Forest lands.

CCC

Item C-9. Residual nesting cover should be monitored and reported annually. We doubt that any dancing grounds on the Grasslands have ever had or will ever have average stubble height of 12 inches within a one mile radius. Adequate residual nesting cover for prairie grouse is an area identified as a research need. More appropriate variability standards should be developed through district wildlife programs.

DDD

AAA Reference is made to the previous responses provided for Comments B, C, and S.

BBB There has been considerable confusion surrounding the Monitoring and Evaluation Plan portion of Chapter IV, Forest Plan. The correct interpretation of Mointoring Item C4 and C5 is further evaluation would be initiated when more than a 5% reduction in effective acres by management area ocurrs within the life (10-15 years) of the Forest Plan. Monitoring activities such as inventories, range analyses, and project analyses would be conducted with emphasis in key wildlife habitats in each management area. The findings of these surveys and/or analyses would be reported every 2 years as part of the monitoring process.

The Monitoring and Evaluation plan has been somewhat restructured in the Final Forest Plan to be more specific and to reduced some obvious confusion.

CCC The Forest agrees. The various wildlife programs and plans will be extremely important to assess population responses to specific habitat changes.

DDD This monitoring item has been modified in the Final Forest Plan.

545 p25

Item D-4. Is the precision of grazing permit compliance techniques actually high? How often are such techniques applied? EEE

CHAPTER V

C. Opportunity to Meet Anticipated Needs

We are not sure how the Forest Service determined that the maximum PC for mule deer on the Little Missouri is approximately equal to present numbers. One of two things is in error; either the estimate of Forest Service present populations are too high or the PC was underestimated. There is no doubt that the potential capacity for mule deer is substantially greater, perhaps 50-100%, than present numbers. This is not to say that a 50-100% increase in mule deer population levels is desired. FFF

We suggest the wording be changed to indicate that the potential capacity for mule deer exceed present numbers or at least the North Dakota Game and Fish Department does not agree with this evaluation.

EEE Grazing permit compliance encompasses such things as numbers of livestock, and compliance with the allotment management plan or annual operating plan. It is relatively easy to determine these whether or not a livestock producer is complying with these conditions of a grazing permit or grazing agreement.

FFF The discussion of the projections of State goals for North Dakota in Chapter V of the Forest Plan has been a source of confusion. This chart and the interpretative discussion has been clarified in the Final Forest Plan.

545p.26

Part IV - Summary Comments.

The general wildlife management direction contained in the proposed alternative represents a substantial improvement over that of past management plans. The plan clearly identifies primary wildlife management problems and potential improvements.

Conflicts between surface uses and the major factors constraining wildlife productivity are also appropriately identified. Most importantly the plan provides direction to protect key habitats and to maintain and enhance the overall quality of other important habitat.

The management standards established for various management areas are, for the most part, very clear and appropriate to the goals for each management area.

The range of management areas and management prescriptions proposed are generally well matched with the range of physiographic characteristics of various lands, available resources and activities proposed in various areas. The exception to this is where oil development and lease commitments overlap with bighorn sheep and elk ranges. Even in these instances the plan places terms and conditions on development to reduce potential conflicts.

The proposed alternative contains a number of important advancements in wildlife resource management that the North Dakota Game and Fish Department strongly supports:

1) The high wildlife management emphasis and constraints on development proposed for 36,248 acres of critical bighorn sheep and elk range (management area C).

2) The strong wildlife management emphasis proposed for 86,330 acres of high value wildlife land (management area D).

3) The identification of hardwood draws and riparian areas as key wildlife habitat and the emphasis placed on improving vegetative condition of these habitats throughout the planning area (management area M & N).

4) The general environmental safeguards, wildlife protective lease stipulations and impact mitigation measures guiding mineral development throughout the various management areas. The limited surface use stipulation for badlands canyon complexes and activity timing and coordination provisions represent significant advances in mineral management. We believe these additional lease conditions are essential to appropriately protect wildlife resources located outside identified key wildlife areas and habitats.

5) The commitment to minimize or avoid adverse impacts to key wildlife habitat within management area "B".

6) Monitoring and evaluation program - The general framework for this program provides excellent sideboards for evaluating progress toward plan goals.

7) The management proposed for Lone Butte and Bennet - Cottonwood former essentially roadless areas (Management area J).

GGG

GGG No response is necessary.

545p21

These principle wildlife management advancements are created by specific wording in goal statements and management standards for various management areas and resources. In order to retain these advances in the final plan, there are several key statements that must be retained:

1) The commitment to resolve conflicts that cannot be successfully mitigated in favor of wildlife in management areas C (Chapter III page 13, part B. Goal) and D (Chapter III page 18, part B. Goal).

2) The proposal to require no surface occupancy (NSO) stipulations on mineral leases within the Tracy Mountain - Moody Plateau and Bullion Buttes - Ponderosa Pines area of D-7 (Chapter III page 22, part 6. 4).

3) The directive to add NSO stipulations and consider mineral withdrawal in management area C (Chapter III page 15, 5. C.)

4) The limited surface use stipulation proposed for canyon complexes in management areas B (Chapter III page 9, 5. b. 3) and D (Chapter III page 22, 6. C. 5)

5) The goal statements for management areas M (Chapter III page 63, B.) and N. (Chapter III page 67, B.).

HHH

Perhaps the most difficult aspect of the plan to assess is the equitability of overall resource balance; and for wildlife resources whether or not this equates to adequate consideration. In other words does the plan provide an appropriate wildlife compromise with other management activities? Much will, of course, depend on the success with which wildlife habitat improvement can be implemented.

The plan establishes approximately 136,000 acres (13%) of land in D-7 and D-8 on which wildlife resources will receive strong management emphasis in addition to unquantified acreages of hardwood and riparian habitats. On approximately 87% of D-7 and D-8 and over 90% of D-1 other resources are favored. We hope these simple facts assure the Forest Service and other interests that <u>at least</u> wildlife has been allotted no more than a share, percentage wise a <u>small share</u>, of land and management consideration.

III

Overall, we are satisfied the plan will establish an active wildlife/habitat management program which should progress toward the general objectives outlined earlier. Provided the changes we have suggested will be incorporated and the primary wildlife advancements we have identified are retained in the final plan, the North Dakota Game and Fish Department believes the plan establishes an excellent management framework.

We are pleased to endorse the proposed alternative and urge its approval. We look forward to working cooperatively with the Forest Service and other interests in making a "fair shake" for wildlife a reality on the National Grasslands of North Dakota.

JJJ

HHH The goal statement for Management Area C has been changed slightly in the Final Forest Plan. As rewritten, this goal statement still reflects the Forest's commitment to manage key wildlife habitat areas for optimum quality and diversity.

III Many factors have been considered in the development and analysis of the Forest Plan. The Forest believes that all sides have compromised and the Final Forest Plan offers the best mix of commodity and non-priced benefits.

JJJ We appreciate your support of the Proposed Alternative. Through your input as well as that of many others, the Final Forest Plan represent a better and more workable management framework for the Custer National Forest and the people we serve.

545 p28

Appendix A. Research Natural Area Sites

1. Name: Two Top - Big Top Research Natural Area - designated

   Location: T144N, R101W, Sec. 10 SW¼
   T144N, R101W, Sec. 9 SE¼, respectively

   Total acreage: Butte tops cover about 2 and 15 acres, respectively

   RNA boundaries are undetermined. Boundary placement is recommended around the butte bases, covering about 50 acres each, based on map interpretation. The 2320' elevation contour interval is an approximate demarcation contour of the butte bases.

   Distinguishing features: The ungrazed, essentially undisturbed prairie butte tops are the key site features.

   Elements: Mixed Grass Prairie

2. Name: Limber Pine Research Natural Area - proposed

   Location: T135N, R105W, Sec. 31 (adjoining private tracts with limber pine are to be entered in N.D. Natural Areas Registry Program).

   Total acreage: 640 (USFS)

   Distinguishing features: The disjunct limber pine stand is the northeasternmost occurrence rangewide, and the only occurrence in North Dakota.

   Elements: Limber pine (Pinus flexilis)
   Pine woodland
   Golden eagle (Aquila chrysaetos)
   Poorwill (Phalaenoptilus nuttallii)
   Squaw currant (Ribes inebrians)

3. Name: Sheyenne Terraces Research Natural Area - candidate

   Location: T135N, R53W, Sec. 2 irregular boundary (see map)
   Sec. 11 most of E½/W½ (see map)

   Total acreage: About 230 acres. Precise mapping of the exclosure fence boundaries that signify RNA boundaries in Sec. 2 is needed, along with mapping of the forest clearing that is to be deleted from RNA consideration within Sec. 11.

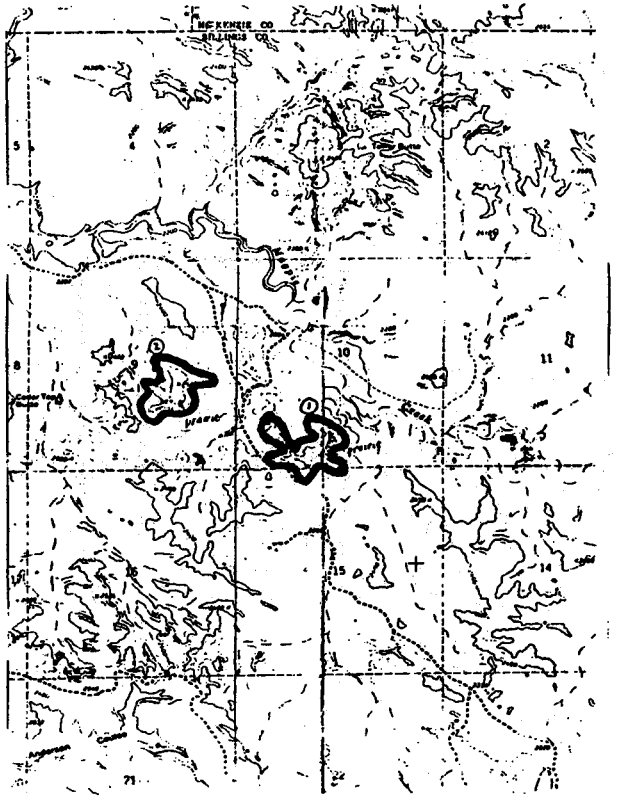
   Distinguishing features: The northern tract is a sandhills exclosure area around a spring-fed stream spur above the Sheyenne River, with 10 rare species. The southern tract is a segment of riverbottom forest along the Sheyenne River.

   Elements: Lowland woodland
   Oak woodland
   Aspen-Birch woodland
   Fen

(A 545 p29

Wetland thicket
Deep marsh
American woodcock (Philohela minor)
Pileated woodpecker (Drycopus pileatus)
Western wood peewee (Contopus sordidulus)
Bog bedstraw (Galium labradoricum)
Buckbean (Menyanthes trifoliata)
Crested fern (Dryopteris cristata)
Lady fern (Athyrium filix-femina)
Marsh fern (Thelypteris palustris)
Showy ladyslipper (Cypripedium reginae)
Spinulose shieldfern (Dryopteris spinulosa)

(A) 545 p 30

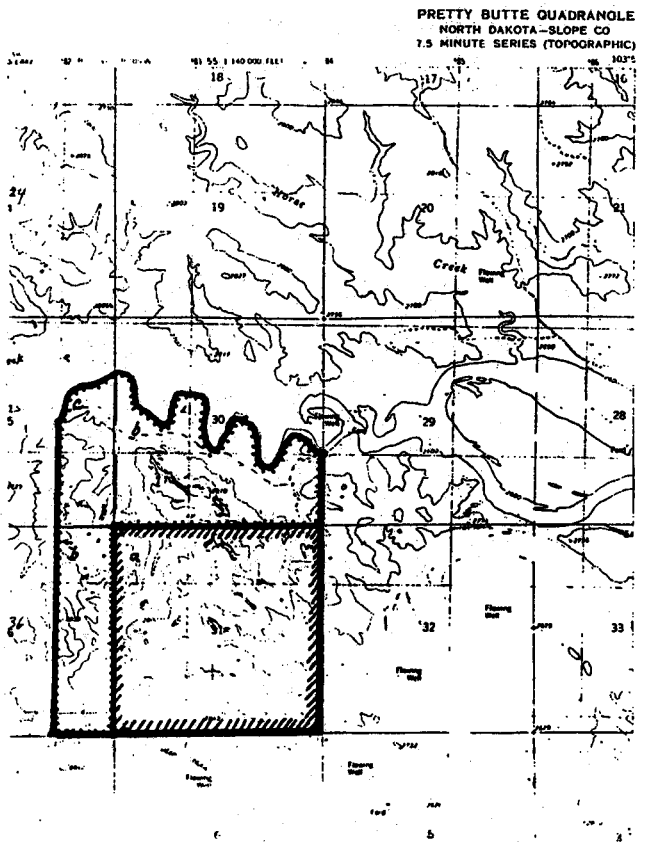


TWO TOP - BIG TOP RESEARCH NATURAL AREA
T144N R101W Sections 9, 10, & 15 (in part)

Recommended RNA Boundary

Scale: 1 5/8 inches = 1 mile NORTH

(12) 545 p 31



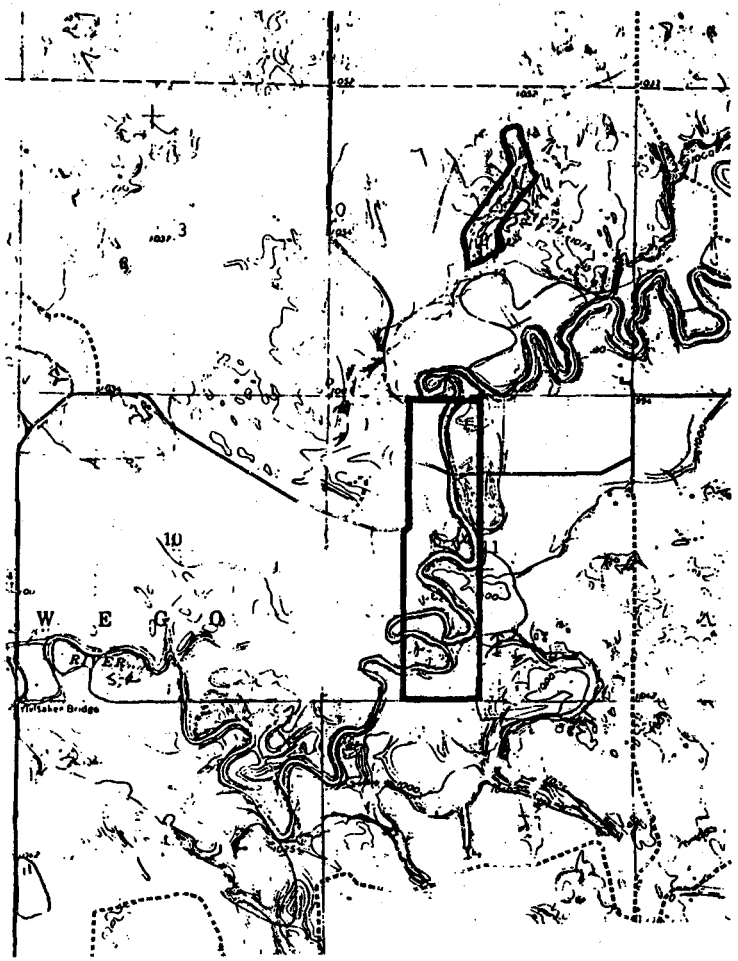
PROPOSED LIMBER PINE RESEARCH NATURAL AREA
T135N R105W Section 31

Proposed RNA - U.S.F.S. Land

Proposed ND Natural Areas Registry Site - Private Tracts

Scale: 1 5/8 inches = 1 mile NORTH

(A) 545 p32



PROPOSED SHEYENNE TERRACES RESEARCH NATURAL AREA
T135N R53W Sections 2 and 11 (in part)

Proposed RNA Boundary

Scale: 2 5/8 inches = 1 mile ↑ NORTH

(E) 545 p 33

Appendix B. Biological Special Interest Area Sites

1. Name: Black Cottonwood Stand Botanical Area

   Location: T138N, R102W, Sec. 12 irregular boundaries within S½

   Total acreage: Roughly 10 acres have been recently fenced within a new exclosure, signifying less than 50% of stand. Depending on outer stand boundaries and local regeneration patterns, fenceline placement needs to be evaluated for SIA demarcation.

   Distinguishing features: This small black cottonwood stand is the easternmost occurrence rangewide, and the only occurrence in North Dakota.

   Elements: Populus balsamifera var. trichocarpa
   Aspen woodland

2. Name: Bullion Butte Biological Area

   Location: T137N, R102W, Sec. 18. This lies within the Bullion Butte Key Critical Wildlife Habitat Area identified in the Draft Plan. Accompanying map shows boundaries of significant features. Additional fieldwork needed to delimit SIA boundaries.

   Total acreage: 600 acres (minimum USFS area). Adjoining property of Griffin and Wosepka is to be entered in the N.D. Natural Areas Registry Program.

   Distinguishing features: Largest butte in North Dakota. It also has three significant rare species occurrences.

   Elements: Mixed grass prairie
   Ravine woodland
   Golden eagle (Aquila chrysaetos)
   Prairie falcon (Falco mexicanus)
   Alyssum-leaf phlox (Phlox alyssifolia)

3. Name: Burning Coal Vein (Columnar Juniper) Natural History Area

   Location: T136N, R102W, Sec. 13 parts of NW¼. Accompanying map has boundaries encompassing SIA features. Further fieldwork needed to delimit boundaries.

   Total acreage: at least 40 acres

   Distinguishing features: The site includes the only coal vein in North Dakota which is still burning (ignition due to natural causes). It also includes the only known stand of Rocky Mountain juniper that has developed a columnar growth form as a result of the burning coal vein vapors. In the area are three rare species and the striking sculptures of eroding sandstone. It adjoins a U.S. Forest Service campground, and there are asphalt paths to its boundaries.

(B) 5 45 p34

Elements: Burning coal vein
Columnar juniper stand
Barren slope
Poorwill (Phalaenoptilus nuttallii)
Mustard twinpod (Physaria brassicoides)
Slender milkvetch (Astragalus gracilis)

4. Name: Denbigh Experimental Forest Botanical Area

Location: Within T156N, R78W, Sec. 36. SIA boundaries would lie within the unplanted portion of the section delineated on the accompanying map.

Total acreage: Minimum 40 acres, maximum 120 acres. Identification of the best prairie tract, locations of rare plants, and determination of long-range planting plans will dictate SIA boundaries. The tract presently referred to as the "native 40" is not necessarily the ideal tract in terms of representativeness.

Distinguishing features: Rolling prairie on sandy outwash plains; undisturbed since U.S. Forest Service acquisition in 1936.

Elements: Mixed grass prairie
Bursage (Ambrosia acanthicarpa)
Rush-like sedge (Carex scirpiformis)

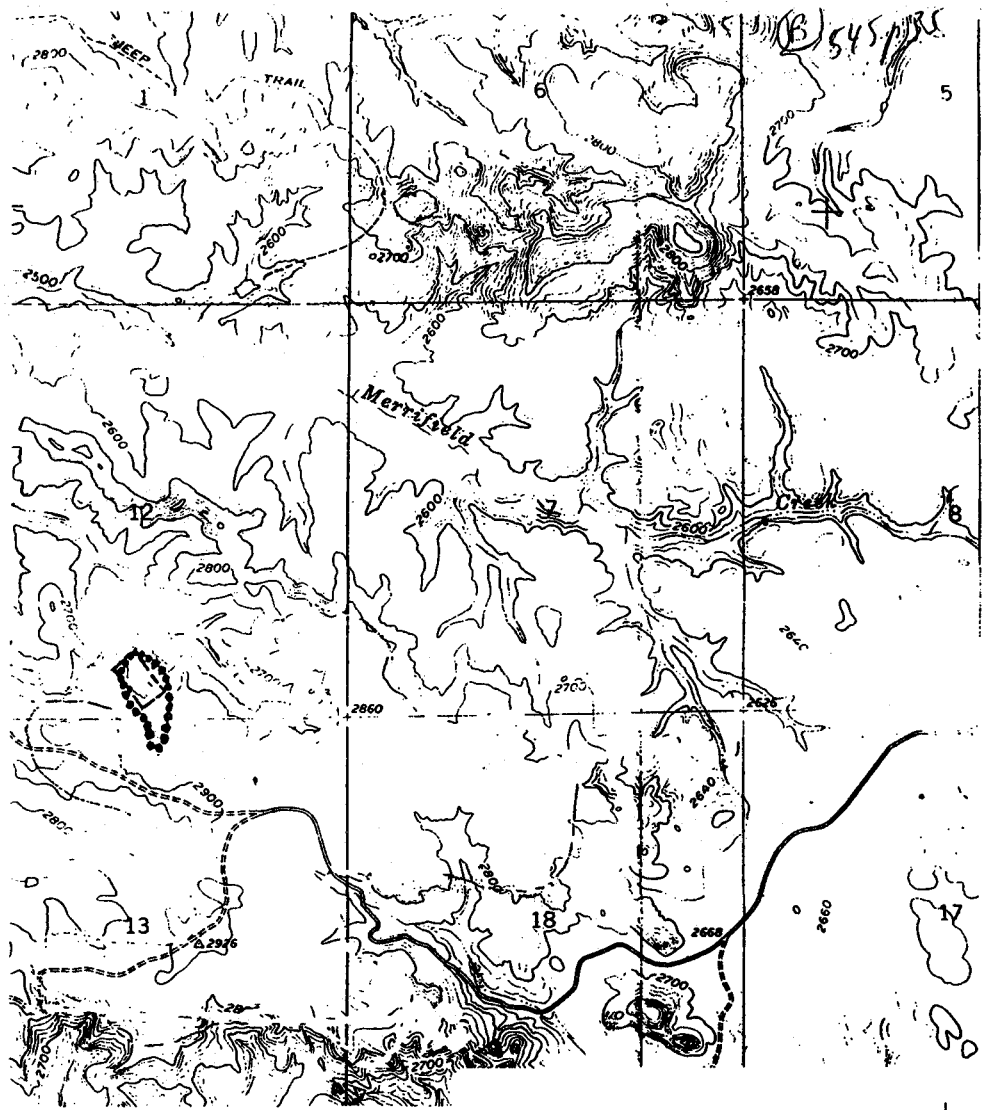
5. Name: Ice Caves Geological Area

Location: T144N, R100W, Sec. 6

Total acreage: To be determined

Distinguishing features: One of the few caves in North Dakota, and the only one with ice year-round.

Elements: Cave



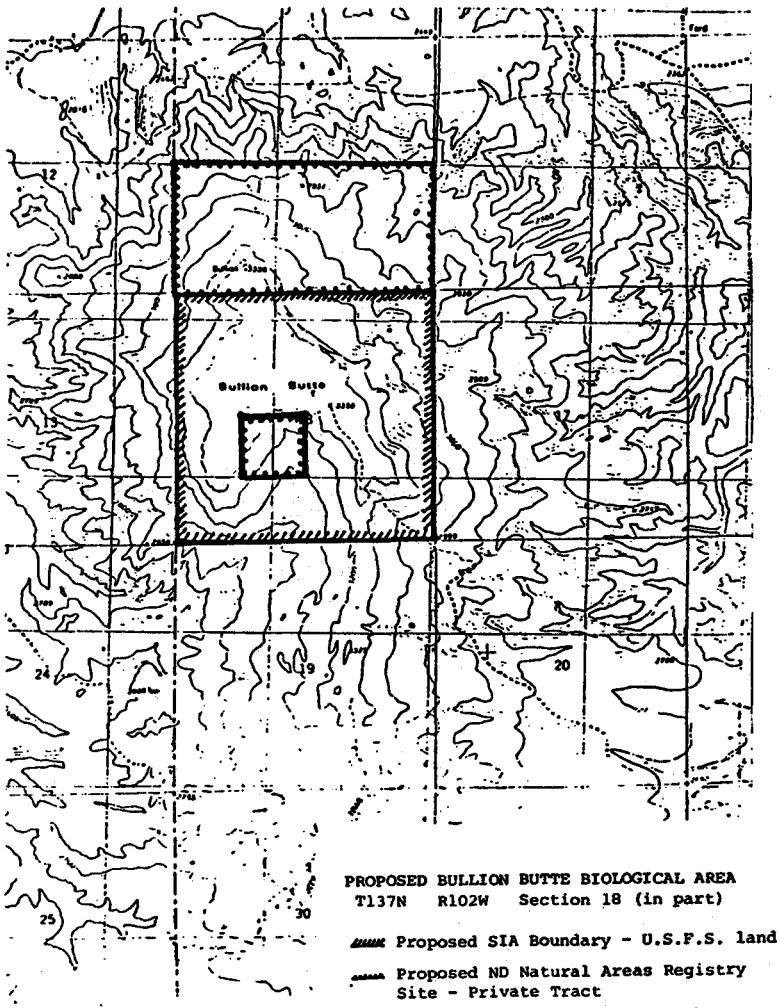
PROPOSED BLACK COTTONWOOD STAND BOTANICAL AREA
T138N R102W Section 12 (in part)

——— Existing Exclosure

•••• Boundary of Black Cottonwood Stand

Scale: 3 1/4 inches = 1 mile ⬆ NORTH

(B)545 p36



PROPOSED BULLION BUTTE BIOLOGICAL AREA
T137N R102W Section 18 (in part)

Proposed SIA Boundary - U.S.F.S. land

Proposed ND Natural Areas Registry Site - Private Tract

Scale: 2 1/16 inches = 1 mile NORTH

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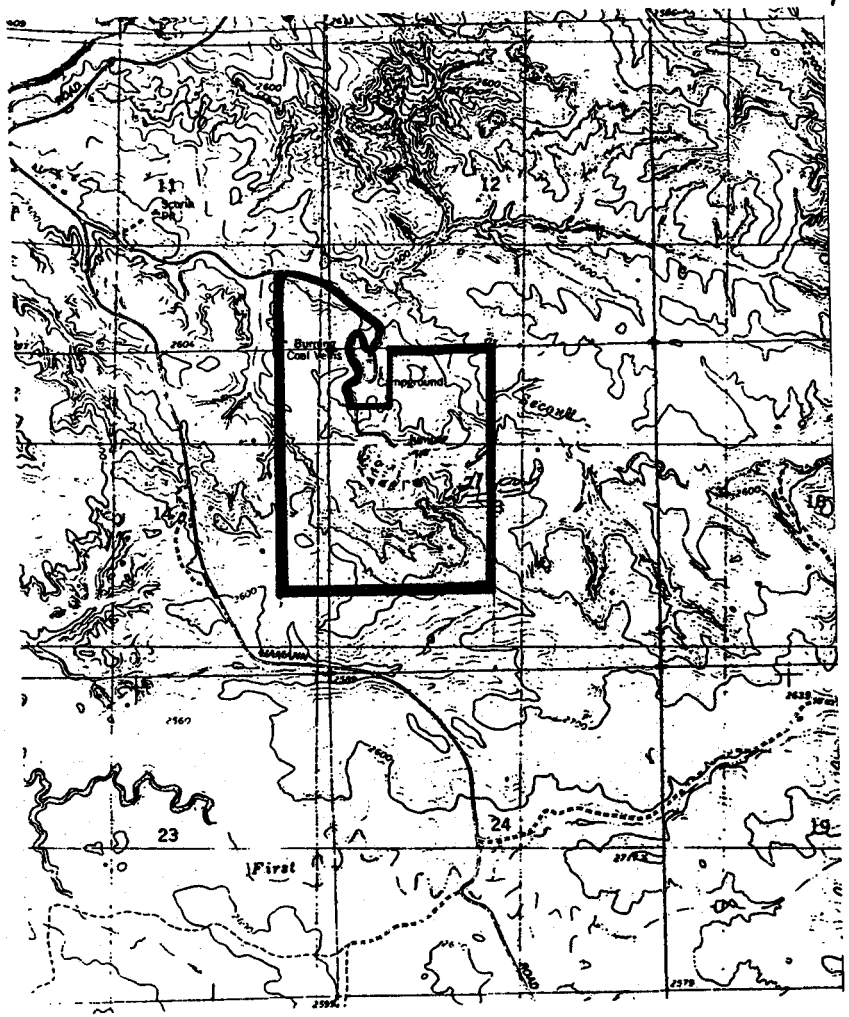
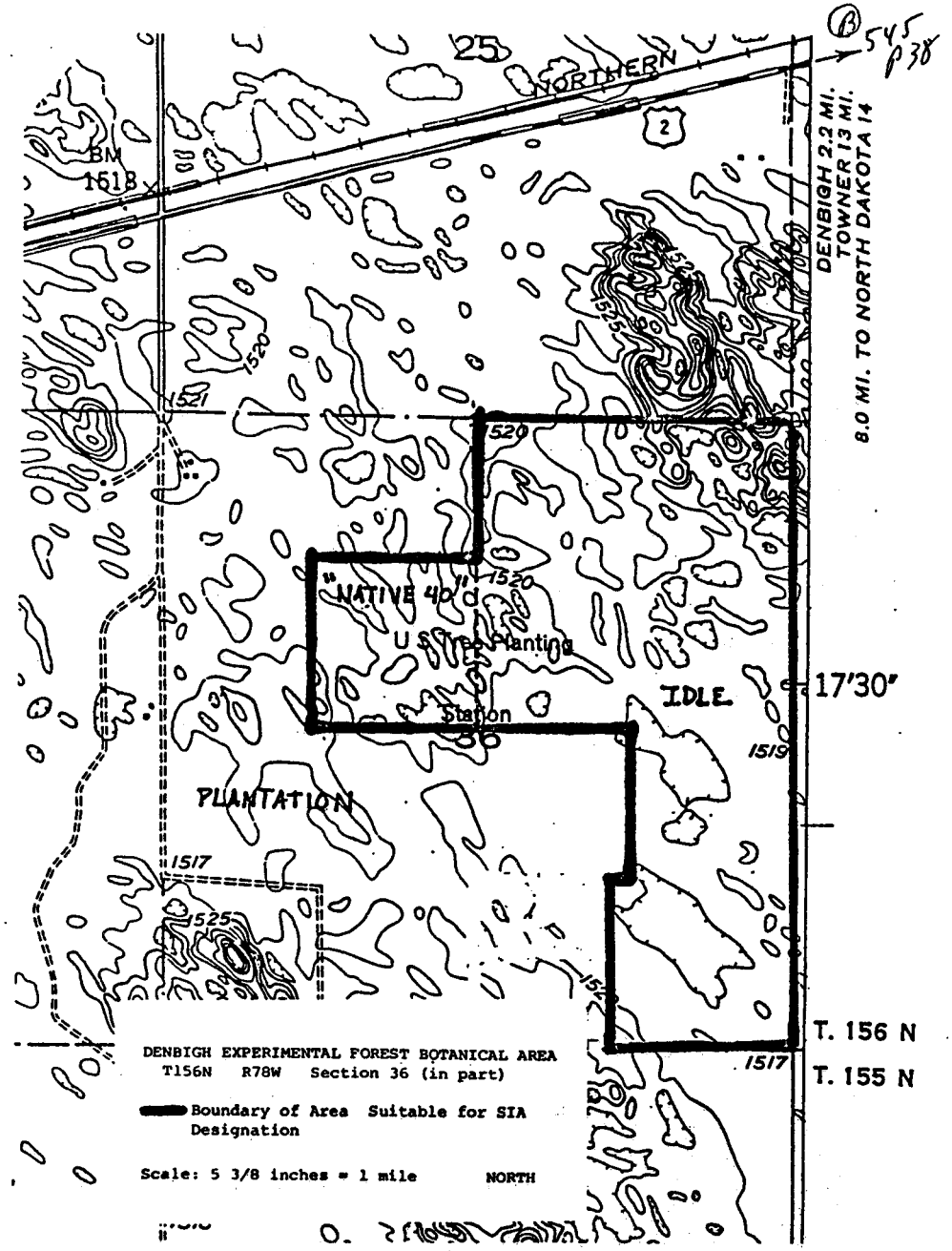
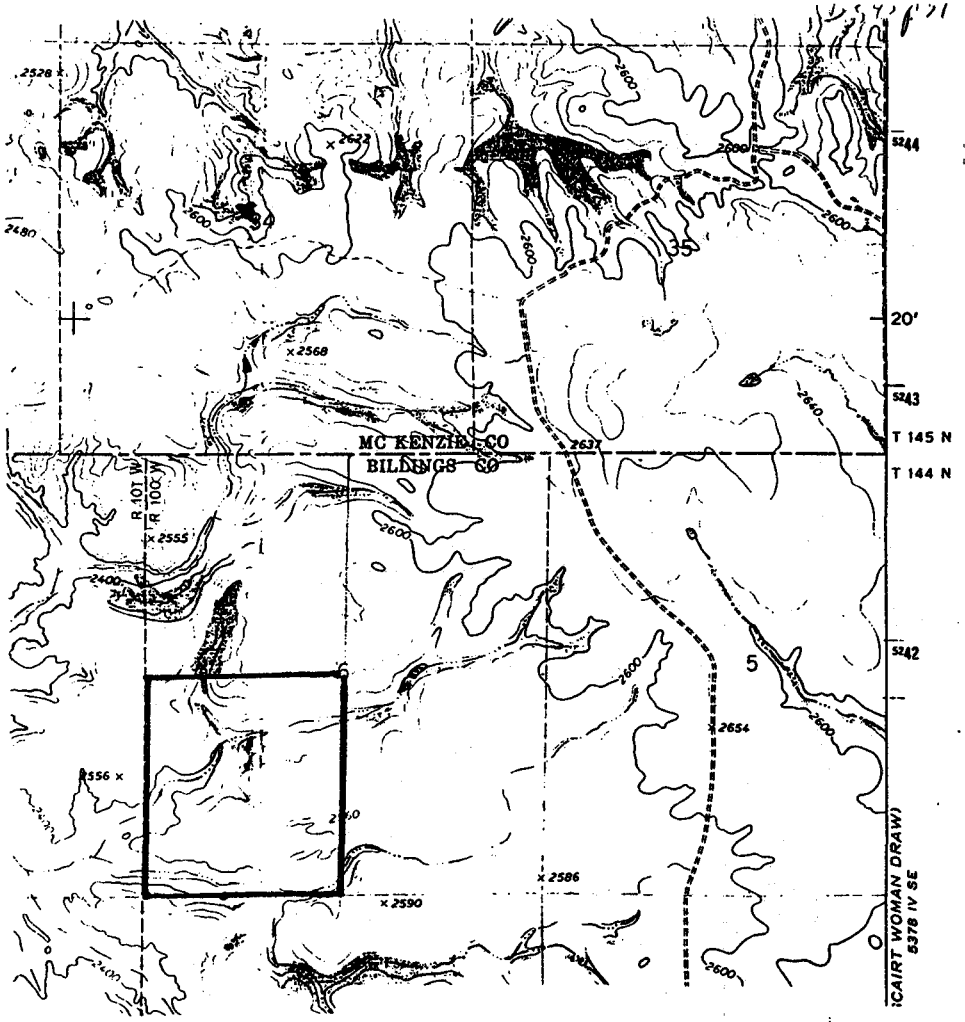


PROPOSED BURNING COAL VEIN (COLUMNAR JUNIPER)
NATURAL HISTORY AREA
T136N R102W Section 13

Boundary of Area Suitable for SIA Designation

Scale: 2 5/8 inches = 1 mile NORTH


25
NORTHERN
2
BM
1618
1521
1520
1519
1517
1525
NATIVE 40'd
U S Tree Planting
Station
IDLE
PLANTATION
17'30"
T. 156 N
T. 155 N
DENBIGH 2.2 MI.
TOWNER 13 MI.
8.0 MI. TO NORTH DAKOTA 14
DENBIGH EXPERIMENTAL FOREST BOTANICAL AREA
T156N R78W Section 36 (in part)
Boundary of Area Suitable for SIA Designation
Scale: 5 3/8 inches = 1 mile
NORTH



PROPOSED ICE CAVES GEOLOGICAL AREA
T144N R100W Section 6

Boundary of Quarter Section With Ice Caves

Scale: 3 3/8 inches = 1 mile NORTH

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Appendix C.

Platanthera leucophaea - Prairie white fringed orchid

Status

The prairie fringed orchid (Platanthera leucophaea) is currently under review by the U.S. Fish and Wildlife Service. The orchid is considered a Category 2 species indicating at the time it was listed the available evidence suggested it qualified as a federally endangered or threatened species but that the U.S. Fish and Wildlife Service felt that additional field studies were needed before its status could be ascertained. At present status reports have been completed for all U.S. FWS Region Three states. With one exception, the authors of the reports unanimously recommended the species be listed as federally endangered or threatened. A regional status report for the Region Six states is now in preparation.

RANGEWIDE DISTRIBUTION AND ABUNDANCE

Rangewide

Platanthera leucophaea is a tall grass prairie species and its range and distribution correspondingly reflects that of its parent community (see Figure). The species reaches the northwest extension of its range in the prairies bordering the Red River Valley. From the Red River Valley it ranges southward into Oklahoma; and eastward in a wedge-shaped pattern into southern Minnesota, Iowa, Missouri, Illinois, Wisconsin, Indiana, Michigan, Ohio, New York and Ontario. Widely scattered and isolated populations have been documented from Maine, Virginia, Wyoming, New Brunswick, Louisiana, and Arkansas.

Although the historic distribution of the orchid encompasses portions of more than 20 states, its small numbers are indicative of its precarious existence. It is believed extirpated from five states and less than 80 extant populations are known. The majority of these populations consist of less than 10 plants. The species survival is jeopardized by the widespread destruction and degradation of its habitat, the tall grass prairie. The Sheyenne National Grassland is widely recognized as harboring the species' largest remaining population.

DISTRIBUTION AND ABUNDANCE IN NORTH DAKOTA

The species has been recorded from only three North Dakota counties and they are: Cass, Ransom, and Richland. Its historic range in the state largely coincides with the sandhills of southeastern North Dakota.

Recent Survey Efforts

In 1982 the Natural Heritage Inventory began an inventory of Platanthera leucophaea in southeast North Dakota. Initial efforts were to reverify all historical collection sites and to delineate the locations of the larger colonies. By 1983 it was known that the largest concentrations of Platanthera leucophaea is in the vicinity of McLeod on the Sheyenne National Grassland. In 1984 the Inventory began a section by section survey of the species in this area. This work resumed in July, 1985, with support from the U.S. Fish and Wildlife Service. At the close of the 1985 blooming season approximately 40

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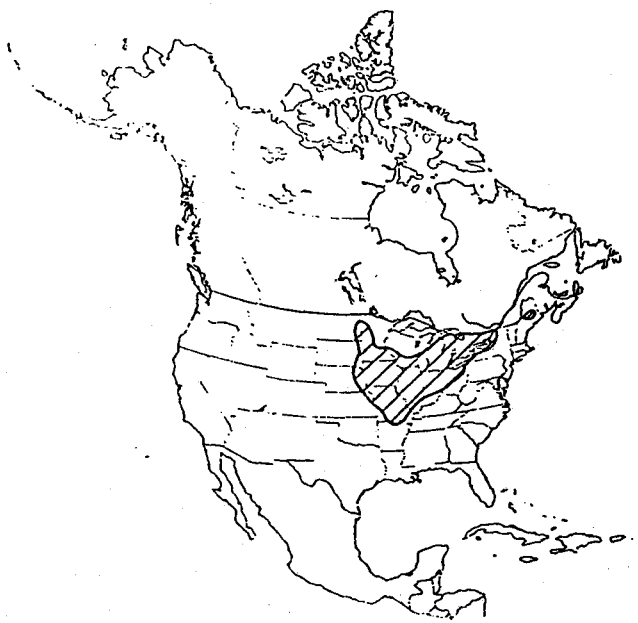
HISTORICAL RANGE OF PLATANTHERA LEUCOPHAEA



Smith, W., et al. 1983. Status Report on Minnesota's Plants. Report of the Plant Group Committee Submitted to the Chairman of the Endangered Species Advisory Committee. Minnesota Department of Natural Resources.

(c) 45 p42

square miles, including the core of the Grassland's population had been surveyed.

The survey and mapping has shown the orchid is widely scattered throughout a significant portion of the Sheyenne National Grasslands. The largest colonies located in the hummocky sand dunes north and west of McLeod. Figure 1 shows the approximate locations of the larger colonies. Small outlier colonies have also been noted to the east and north. Although a few colonies are known from private tracts the vast majority are on Forest Service owned lands. All known occurrences have been mapped onto 7.5 minute U.S.G.S. topographic maps. These are on file at the North Dakota Heritage Inventory. Duplicate sets of these maps are being prepared for the U.S. Fish and Wildlife Service and the Forest Service District Office in Lisbon, ND.

A precise population estimate of the orchid in the Sheyenne National Grassland and environments is difficult to derive. Surveys from 1982 through 1985 have documented approximately 1900 flowering individuals. It is assumed the existing population is somewhat larger than this.

HABITAT

Platanthera leucophaea grows in graminoid dominated communities in the tall grass prairie region with seasonally high water tables. In the western half of its range, (including North Dakota), it is most commonly associated with rich calcareous prairie swales. The species prefers full sun. In North Dakota sandhills the orchid is restricted to interdunal swales. Typical swale dominants include Carex lanuginosa or Poa pratensis.

MANAGEMENT CONSIDERATIONS

The relationship between the management of the Sheyenne National Grassland and the survival of the orchid is complex and demands further study. Most of the Grassland is grazed using a three pasture deferred rotation grazing system. Without direct habitat manipulation livestock utilization of the prairie swales in areas managed by this system is low. Recent estimates set this utilization rate at 10%. Shrubs have been noted to increase in swales under these conditions. Burning swales on a rotation basis reduces lowland shrub densities and increases lowland utilization to an estimated 50-80% (Barker 1982). Mowing has been noted to also control shrub encroachment and increase livestock utilization of the Grassland's prairie swales several-fold. As a result it is now regularly used in the Grassland as a prescribed management tool.

It has been suggested that periodic burning or mowing may enhance the survival and reproduction of Platanthera leucophaea. In other states several investigators have noted that burning in the spring or fall stimulates growth and flowering in the orchid. The relationship between mowing and orchid viability is less clear. Mowing removes above-ground plant material and thus mimics fire in some regards. However, the timing of prescribed mowing differs from that of burning. This difference is perhaps critical to the orchid. Prescribed burns are generally conducted in early spring or late fall, after the orchid has set seed. Mowing, on the other hand, is done in mid-summer before seed maturation, at about the time the orchid is in bloom.

A further concern is the detrimental effect of livestock on Platanthera leucophaea. In the past four years, losses from trampling and foraging activi-

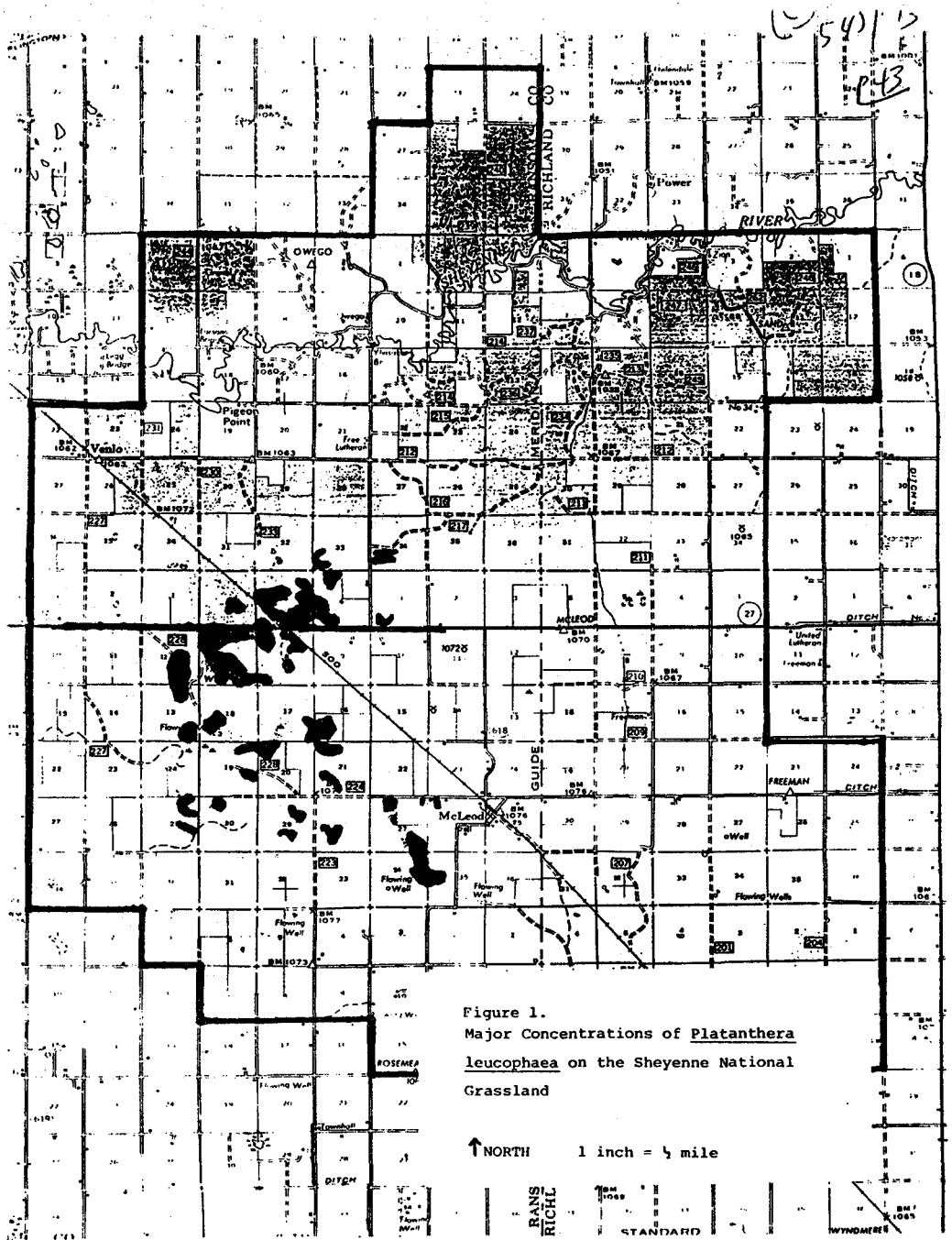


Figure 1.
Major Concentrations of Platanthera leucophaea on the Sheyenne National Grassland

↑NORTH 1 inch = ½ mile

(c) 545 P44

ties have been observed. The magnitude of these losses, alone or in conjunction with mowing or burning, remain to be quantified.

The above considerations require further study. It is generally acknowledged that the management practices on the Sheyenne National Grasslands impact the orchid. The questions remaining are how, how much, and what needs to be done to insure a viable population. Baseline data is needed, along with a monitoring program and a study to assess the effects of livestock, burning and mowing.

Barker, W.T. 1982. Manipulation of plant species, composition, animal distribution, and herbage production by burning. Bulletin of the Ecological Society, Program Issue. 64(2):110.

Appendix D. TABLE I. Rare Plant Species Documented From Forest Service Lands

Species	Extant Populations Documented on Forest Service Lands	Location/Proposed Management Unit	Recommendation
Aster sericeus	No	-----	-----
Astragalus gracilis	Yes	Proposed Burning Coal Vein SIA T136N, R105W, Sec. 31	No action anticipated after designation
Athyrium filix-femina	Yes	Candidate Sheyenne River RNA, Management Unit M and other riparian areas along Sheyenne River	Manage to protect riparian habitat
Campanula aparinoides	Yes	Management Unit M T135N, R53, Sec. 23 (in part) T135N, R53, Sec. 24 (in part)	Manage to protect riparian habitat
Carex leptalea	Yes	Management Unit M T135N, R53W, Sec. 14 (in part)	Manage to protect riparian habitat
Cypripedium reginae	Yes	Candidate Sheyenne River RNA and Management Unit M T135N, R53W, Sec. 14 (in part) T135N, R53W, Sec. 2 (in part)	Manage to protect riparian habitat
Dryopteris cristata	Yes	Candidate Sheyenne River RNA, Management Unit M and other riparian areas	Manage to protect riparian habitat
Dryopteris spinulosa	Yes	Candidate Sheyenne River RNA, Management Unit M and other riparian areas	Manage to protect riparian habitat
Eriophorum gracile	Yes	Management Unit M T135N, R54W, Sec. 24 (in part)	Manage to protect riparian habitat
Galium labradoricum	Yes	Candidate Sheyenne River RNA T135N, R53W, Sec. 2 (in part)	No further action needed after designation
Gymnocarpium dryopteris	Yes	Management Unit M T135N, R53W, Sec. 14 (in part)	Manage to protect riparian habitat
Helianthemum bicknellii	No	-----	-----

Appendix D. TABLE I. Rare Plant Species Documented From Forest Service Lands

Species	Extant Populations Documented on Forest Service Lands	Location/Proposed Management Unit	Recommendation
Hypericum boreale	No	-----	-----
Liparis loeselii	Yes	Management Unit A T134N, R53W, Sec. 6 (in part)	Manage to protect habitat
Menyanthes trifoliata	Yes	Management Unit M T135N, R54W, Sec. 24 (in part)	Manage to protect riparian habitat
Onoclea sensibilis	Yes	Management Unit M and other riparian area T135N, R52W, Sec. 4 (in part)	Manage to protect riparian habitat
Ophioglossum vulgatum	Yes	Management Unit A T134N, R53W, Sec. 30 (in part)	Manage to protect habitat
Phlox alyssifolia	Yes	Proposed Bullion Butte SIA T137N, R102W, Sec. 7 and 8 (in part)	Manage to protect habitat
Physaria brassicoides	Yes	Proposed Burning Coal Vein SIA T136N, R102W, Sec. 13 (in part)	No action anticipated after designation
Pinus flexilis	Yes	Proposed Limber Pine RNA T135N, R105W, Sec. 31	No action anticipated after designation
Populus balsamifera ssp. trichocarpa	Yes	Proposed Black Cottonwood SIA T138N, R102W, Sec. 12 (in part)	Periodic field check to ascertain regeneration status
Pycnanthemum virginianum	Yes	Management Unit M T135N, R54W, Sec. 24 (in part)	Manage to protect riparian habitat
Ribes inebrians	Yes	Proposed Limber Pine RNA T135N, R105W, Sec. 31	No action necessary after designation
Salix pedicellaris	Yes	Management Unit M T135N, R54W, Sec. 24 (in part)	Manage to protect riparian habitat

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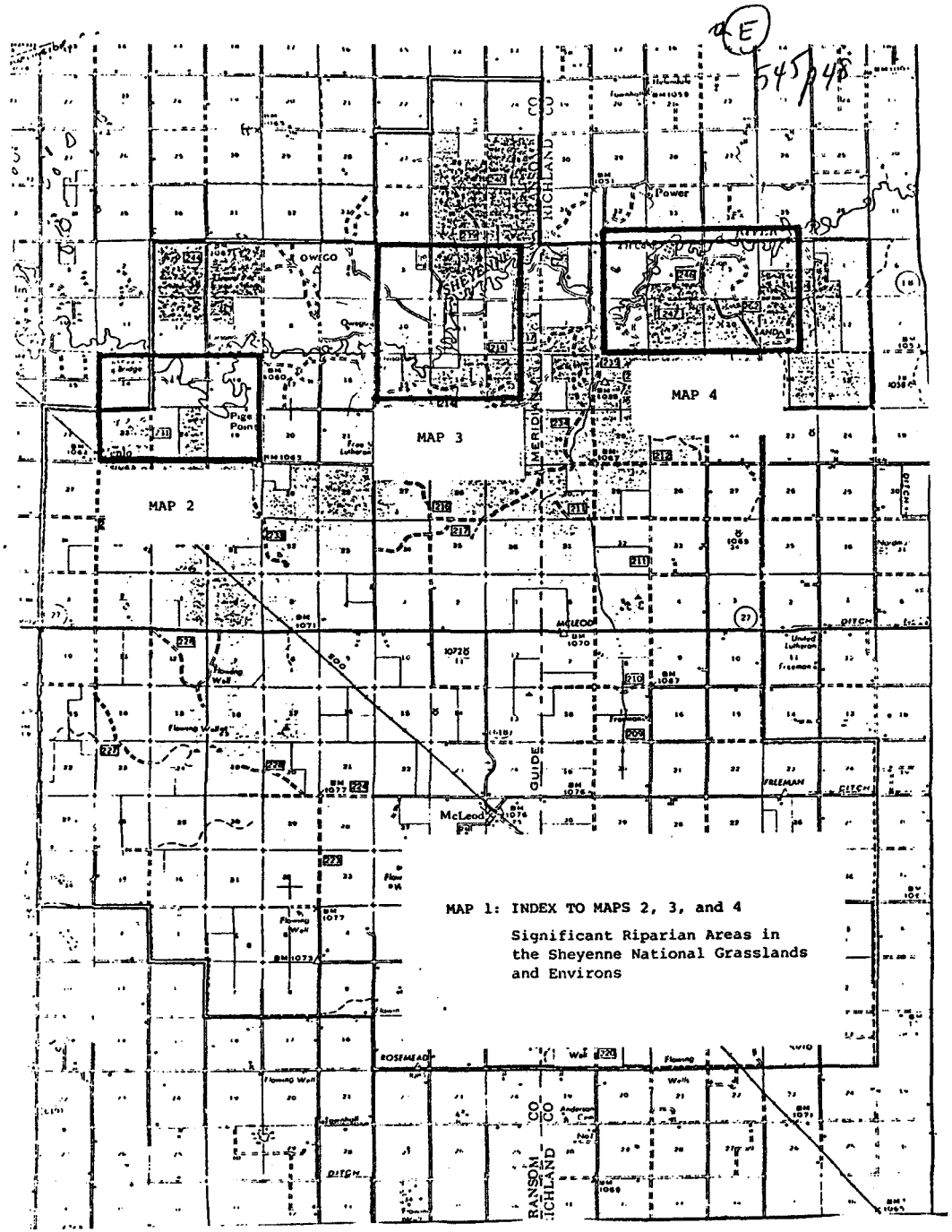
Appendix E. Rare Plant Occurrences Along the Sheyenne River

The Sheyenne River Valley has long been recognized for its biotic diversity. Its riparian forests and perched wetlands harbor many rare plant species and outstanding natural communities. Many of the perched wetlands are fed by seeps and underlain by peat. These in particular support a unique flora.

The North Dakota Natural Heritage Inventory sponsored field investigations along the Sheyenne River in 1982, 1983, and 1984. These yielded up-to-date site specific information on the Sheyenne's rare species and natural communities. Maps 1 through 4, (Map 1 being an index to the remaining maps), delineate the rare plant populations found on Forest Service owned riparian tracts or adjoining lands. Species-specific information regarding these occurrences is available through the Natural Heritage Inventory upon request.

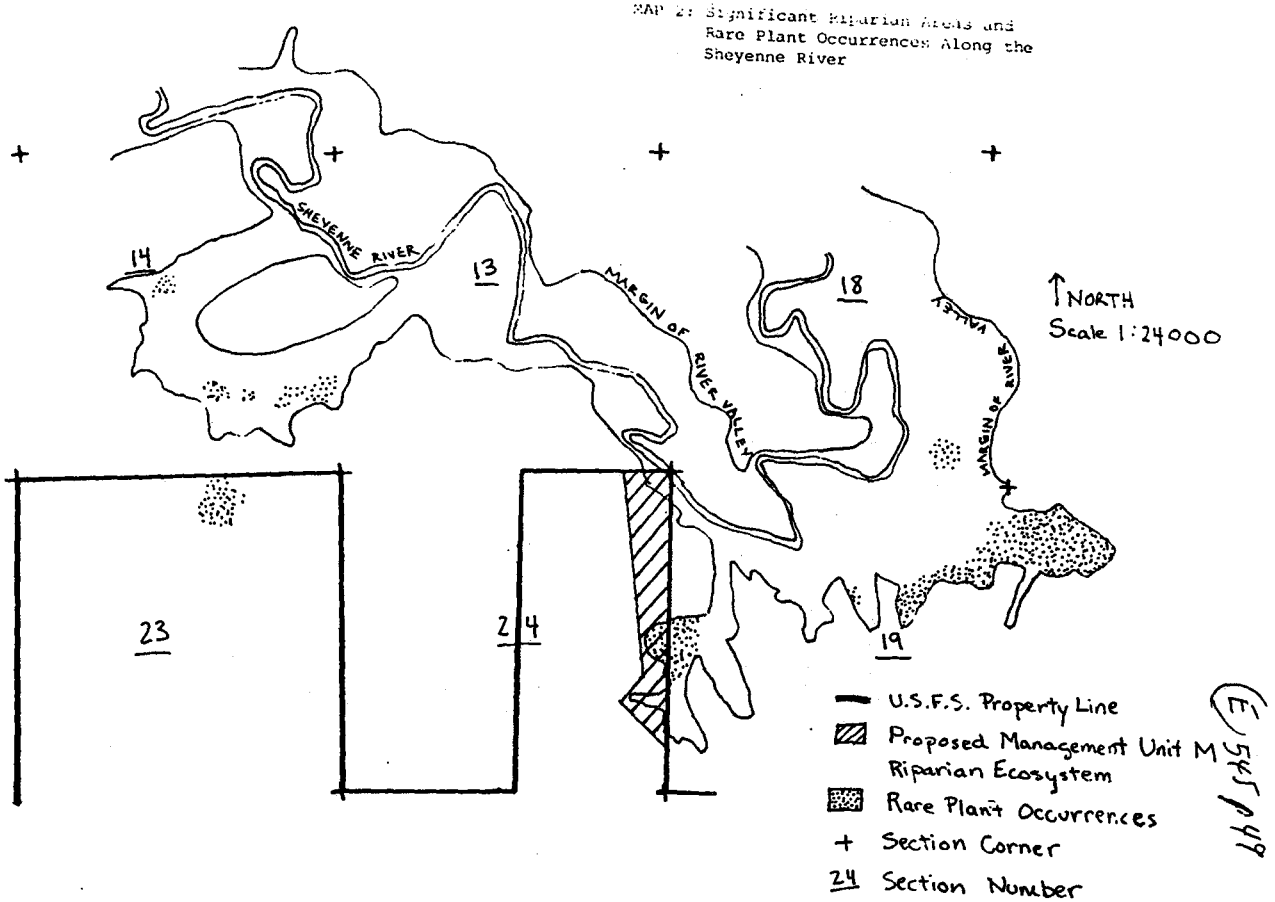
Riparian areas along the Sheyenne, because of the nature of their composition, substrates, slope, and hydrology are fragile ecosystems susceptible to rapid degradation. In recognition of this and the unique biological attributes they possess the Forest Service has proposed two tracts for RNA designation and identified several other areas as Management Unit M. We fully support the Forest Service's decision to give these areas special recognition. In addition to supporting these designations we recommend the Management Unit M category be extended to all the riparian areas owned by the Forest Service harboring rare species; and, that, activities on these areas be managed to maintain the habitat and viable populations of the species of concern.



MAP 1: INDEX TO MAPS 2, 3, and 4

Significant Riparian Areas in the Sheyenne National Grasslands and Environs

MAP 2: Significant Riparian Areas and Rare Plant Occurrences Along the Sheyenne River



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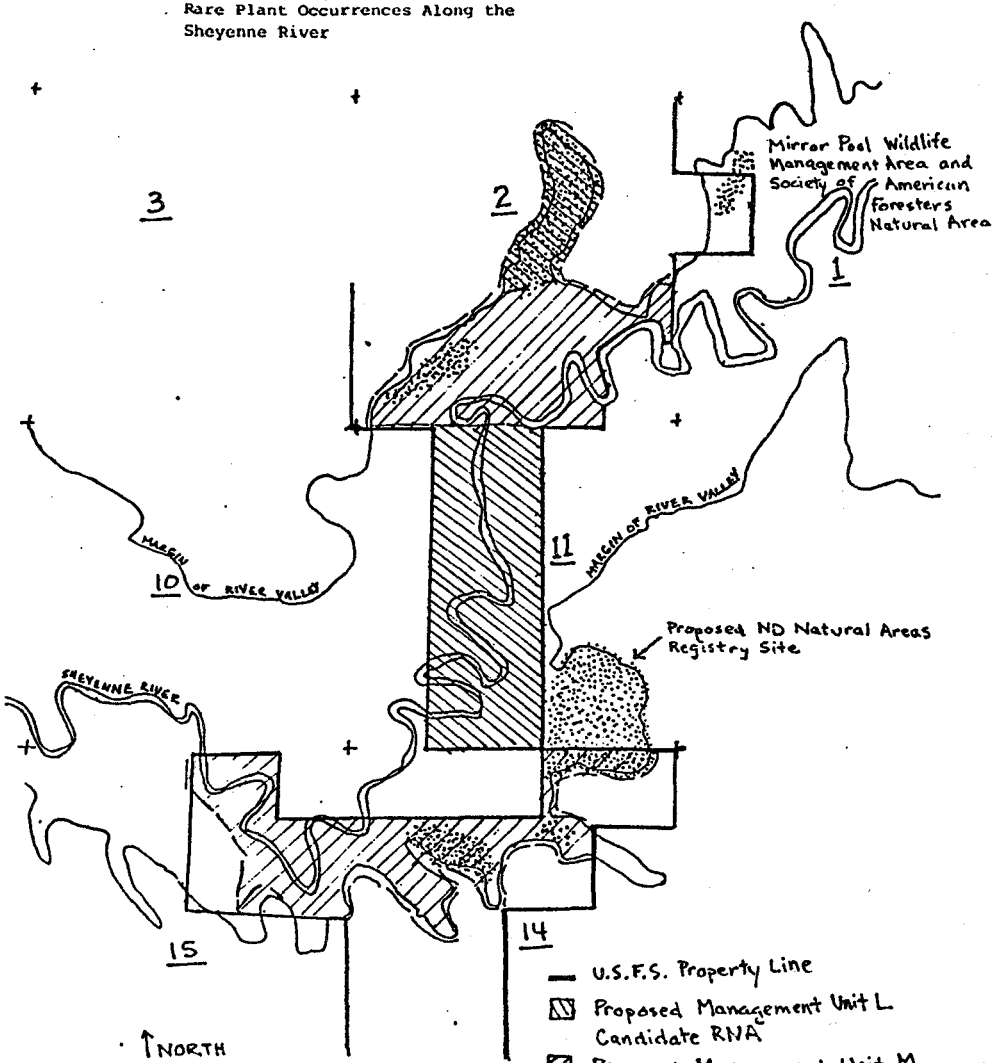
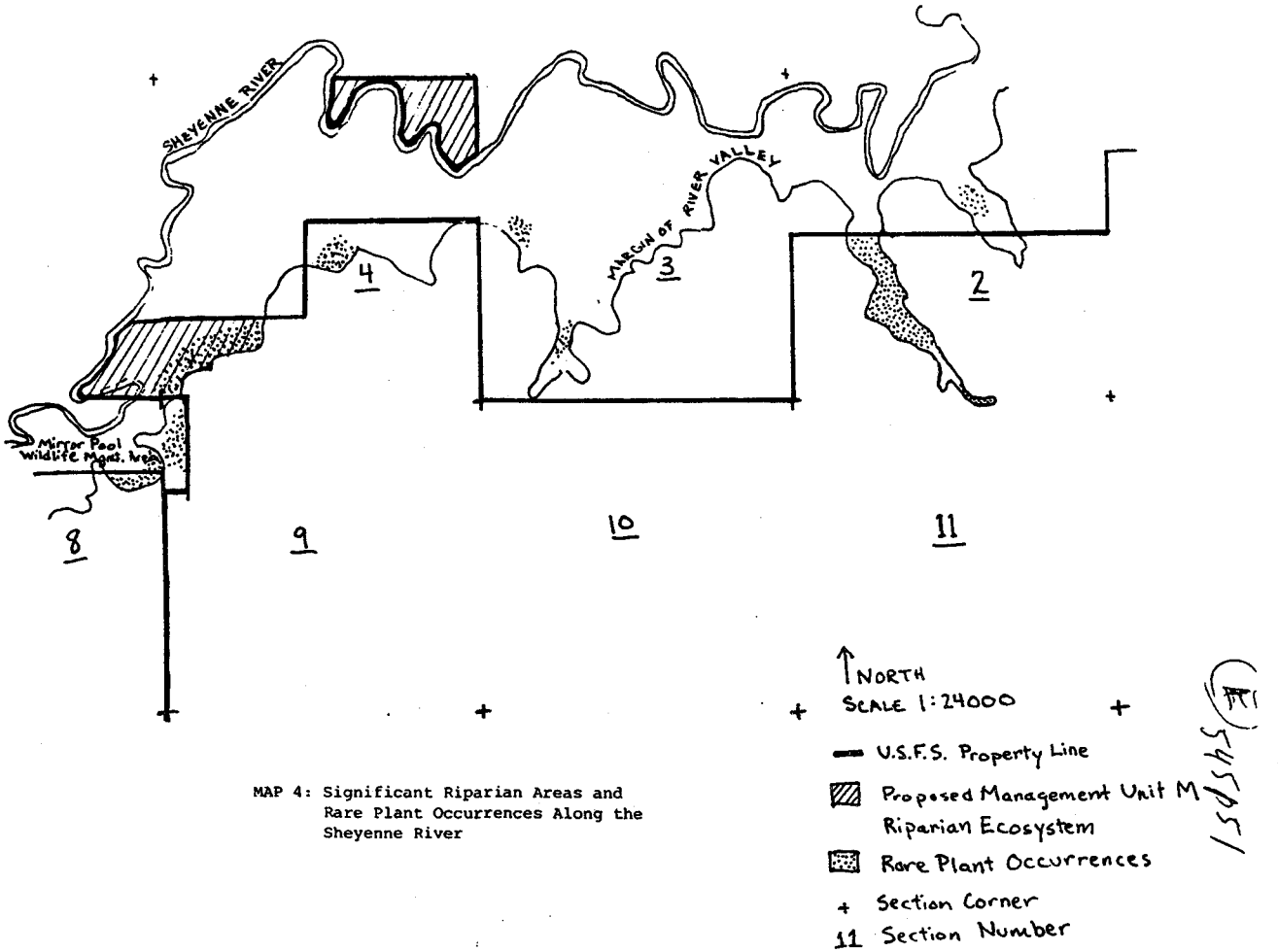
MAP 3: Significant Riparian Areas and Rare Plant Occurrences Along the Sheyenne River





MAP 4: Significant Riparian Areas and Rare Plant Occurrences Along the Sheyenne River

COOPERATIVE EXTENSION SERVICE
NORTH DAKOTA STATE UNIVERSITY OF AGRICULTURE AND APPLIED SCIENCE
U S DEPARTMENT OF AGRICULTURE COOPERATING. FARGO, NORTH DAKOTA 58105

August 28, 1985

Plan Comment Letter #570

Dave Filius
Forester Supervisor
Custer National Forest
P.O. Box 2566
Billings, MT 59103

Dear Mr. Filius:

I am writing to you in reference to the management plan for the Custer National Forest. I have asked for and received complete copies of the plan. Due to the expensive nature of the plan and the importance of the issues involved, it has taken me sometime to evaluate the plan.

As an Extension Wildlife Specialist, I am concerned with the potential effects that the outlined management directives may have on our grassland resources, livestock producers and wildlife and wildlife habitat. At this point I wish to compliment your staff for their efforts in developing a management plan which gives equal and proper consideration to all grassland interests. Particularly, I support the plans emphasis on wildlife management, the protection from development being afforded critical bighorn sheep and elk habitat, the designation of woodlands and riparian areas as key wildlife habitat, and the subsequent commitment to improve habitat conditions in these areas. A

As with most written plans, the Custer National Forest plan has been written as to appear to promise everyone something again without giving the details of how general goals can be obtained. The initial remedy to this situation would appear to be district plans comprised of quantifiable goals with specific obtainability measures outlined. B

Livestock and Wildlife

In general, the overall plan lacks a detailed monitoring program to measure both livestock use (to insure compliance with permitted use) as well as a program to measure wildlife management progress. It is the grasslands that suffer in the long-run if programs are not adequately monitored. As an example, cattle herds on grassland areas under drought conditions should have been reduced 2 years ago in 1982 and not just in 1985. C

Livestock use has lead to the degradation of woody draws. Stocking rates for livestock should be reduced in these key wildlife habitat and this reduction should be reflected as part of the allotment management plans. Management options to include fencing, grazing systems, and water development should also be used to ameliorate grazing pressue on these habitats. D

285

A No response is necessary.

B The Forest Plan states the expected outputs, general Forest managemet direction, and conditions of the Forest that can be anticipated under the Proposed Action (Alternative 10) in Chapter II. Chapter III of the Forest Plan gives more detailed management direction for each separate management area. Even so, the purpose of the Forest Plan is not to give site specific management direction that will apply to every resource management decision. Site specific analyses such as range allotment management plan will be used to implement the broad direction established in the Forest Plan.

C There has been considerable confusion surrounding the Monitoring and Evaluation Plan portion of Chapter IV, Forest Plan. The intent of the Monitoring and Evaluation section of the Forest Plan is not to outline the many site specific project level monitoring actions that will continue to be ongoing, but to provide the "sideboards" to measure the progress and results of implementing the management direction in the Forest Plan. The individual allotment management plan (AMP) will continue to be the tool to implement management objectives on an allotment by allotment basis. Range analyses, and production-utilization studies tied to AMP's will form the basis of much of the range management monitoring. These studies will be used to help measure livestock use to insure that overall management objectives are being met (Monitoring Item C1, Monitoring Action Plan, Chapter IV, Forest Plan). In the Final Forest Plan The Monitoring and Evaluation plan has been somewhat restructured and expanded to be more specific and to reduced some obvious confusion.

D The management of woody draws continues to present a challenge to the Forest. Livestock use in these areas can be very demanding on the resources, and the ecology of these areas is not completed understood. Improving the range condition of woody draws does not appear to be as simple as reducing livestock numbers. The current literature suggests that:

"Vegetation in meadows and drainageways is closely utilized (by livestock) under any stocking rate or system of grazing. Reducing the livestock or adjusting grazing seasons usually will not solve the problem". (Amour, C.L. 1977. Effects of deteriorated range streams on trout. Quote from A. Hormay, personal communication).

Recent research from the Rocky Mountain Forest Research Laboratory, Rapid City, South Dakota found that protection from cattle browsing made an important differnece in development of sprout clumps (of woody species) but did not affect number of sprouts surviving after three years. Heavily browsed sprout clumps may or may not die. (Bjugstad, A.J. and M. Girard. 1985. Wooded Draws in Rangelands of the Northern Great Plains).

The Forest Plan provides for management practices such as fencing, more intensive grazing systems, water developments, and possibly shade shelters to discourage use of wooded draws by cattle. Monitoring of these special habitats is identified in Monitoring Items C4 and F4 (Chapter IV, Forest Plan).

#57092

Oil and Gas Development

Due to the wholesale leasing done under the 1974 management plan and the extensive development and road building that has resulted since, it appears that mineral development can neither be predicted or controlled. In general to get somewhat of a handle on this dilemma, any additional leasing in essentially roadless areas outside of existing oil fields should state no surface occupancy. In addition, restoration of roadless lands that have been developed, to include the removal and closure of oil roads not identifed as permanent, must be undertaken. The transportation plan should identify all permanent roads and road removal and closure conditions should be part of new lease stipulations. E

The Planning Process

The service, in my opinion, was in error in scheduling public hearings on the new plan. I realize that the number of public hearings scheduled precluded evening meetings in a number of locales. The afternoon meetings were ill-attended and thus most of the information or mis-information about the plan was negative. Additional media comments to the effect that, "comments are good, but will have little effect on the outcome of the plan", do little to bolster your agency's image or add creditability to your planning process. F

I thank you for the opportunity to comment on the plan.

Sincerely,

Terry Messmer

Terry A. Messmer
Extension Wildlife Specialist

TAM:bc

286

E Although the old concept of essential roadless areas (ERAs) is not carried forward in the Forest Plan, the roadless resource concept is not being discarded. The roadless inventory will be tracked over time, however, the managmeent of those lands will provide for other uses and the terminology of "low development areas" will be used (Management Area J). The management direction for mineral leasing in Management Areas J states that when lease applications are received or existing oil and gas leases expire or terminate, they will not be recommended for re-issuance or leased with No Surface Occupancy (NSO) stipulation. This same management direction is established for Management Area C (Chapter III, Forest Plan, Management Area C) which contains significant portions of the old ERA's. The remaining portions of the old ERA's are included in other management areas that allow for the orderly development of the mineral resources. In response to the public comments, the Forest completed additional analysis of management options as they relate to minerals management within the old ERA's. The criteria analyzed were mineral ownership, surface ownership patterns, lease status, and mineral potential. The Forest also considered the public support for roadless or low development areas. The final Forest Plan and EIS recommends three additional areas or approximately 30,000 acres to be managed for Low Development management. The remaining portions of the old ERA's will be managed as part of other management areas (Chapter III, Forest Plan, Management Areas B, D, and E).

The long term objective of rehabilitating and restoring low development and roadless characteristics to oil impacted areas has been included in the resource summary for the Wilderness and Roadless Resource (see Forest Plan, Chapter II).

F During the public comment period, only one afternoon meeting (in Fargo, North Dakota) was scheduled. Public meetings were and will continue to be just one tool to inform the public about the management of the Custer National Forest.

The identification of permanent roads, roads to be removed, and road closure conditions are not management considerations that can be included as stipulations to mineral leases. The Transportation Plan which was completed as part of the forest planning process identifies the additional amount of roads needed to implement the Forest Plan. The Forest Plan provides road construction standards and guidelines in Chapter II and more specific direction in each Management Area (Chapter III). Temporary roads associated with oil and gas development will be closed when no longer required.

United States Department of the Interior

OFFICE OF THE SECRETARY
OFFICE OF ENVIRONMENTAL PROJECT REVIEW
Denver Federal Center, Building 67, Room 488
P.O. Box 25007
Denver, Colorado 80225-0007

August 29, 1985

IN REPLY REFER TO
ER 85/657

Forest Plan Comment Letter # 609

Mr. Dave Filius
Forest Supervisor
Custer National Forest
U.S. Department of Agriculture
2602 1st Avenue North
P.O. Box 2556
Billings, MT 59103

Dear Mr. Filius:

The Department of the Interior has reviewed the proposed Custer National Forest and National Grasslands Land and Resource Management Plan and Draft Environmental Impact Statement, and offers the following comments.

Fish and Wildlife Resources

Although the U.S. Forest Service (FS) mandates for multiple-use land and resource management planning are primarily exemplified by increases in livestock grazing (animal unit months) and oil and gas development, the Plan also contains a strong commitment to wildlife management. The U.S. Fish and Wildlife Service (FWS) fully supports management direction which provides greater emphasis on the protection and active management of key species and their associated habitats than did the previous Forest Plan. A

For example, elk, bighorn sheep, raptors, prairie dogs, and threatened and endangered species are all highlighted as species of special interest and will receive special management consideration in certain areas. Management Areas C and D will be managed respectively to optimize conditions for certain wildlife species, or to maintain or improve quality and diversity of key wildlife habitat. In both management areas, resource conflicts, including those from livestock grazing and minerals development, that cannot be successfully mitigated will be resolved in favor of wildlife and wildlife habitat. A

Throughout the planning documents the FS has acknowledged the inverse relationship between wildlife provided capacity and livestock use of rangeland, wooded draws and riparian habitats. We are pleased that both riparian zones and woody draws are being treated as unique management areas. The management standards listed for the riparian ecosystem and woody draws (Management Areas M and N, respectively, on pages 63-70 of Chapter III of the Plan) are well organized and provide direction to maintain and improve the wildlife habitat conditions of these areas. The management direction and intent appear to comply with Executive Order 11990 (Protection of Wetlands) and Forest Policy (2527.03) as written under Forest Service Manual Title 2500 - Watershed Management. B

C

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A The wording of the goal statements for Management Areas C and D has been changed slightly in the Final Forest Plan. The management goal of these areas remains to maintian or improve the quality and diversity of wildlife habitat.

B No response is necessary.

C Agree. No response is necessary.

Specifically, Forest Policy in this document states that: "The Forest Service shall . . . Avoid, to the extent possible, long- and short-term adverse impacts which may be associated with the occupancy and modification of floodplains and with the destruction, loss or degradation of wetlands."

C

The issue of range management versus wildlife management on the Custer National Forest and especially the National Grasslands has been longstanding. The most significant and continuous impacts to wildlife habitat have resulted from years of livestock grazing and past range management practices. We are pleased to see the FS integrating active wildlife management into the range management program. The specific livestock management directions for Management Areas C and D, hardwood draws (Management Area N), riparian zones (Management Area M), and roadless areas, and the range management direction in general, will favor the improvement of wildlife habitat conditions. We recognize that the key to affecting most of the livestock/wildlife issues and implementing the intent of the Plan is through the Grazing Allotment Management Plans (GAMP). Therefore, we offer our support and request the opportunity for input at the District level to develop GAMP's which will provide greater consideration for wildlife values.

D

The FS minerals management program, primarily oil and gas development, will continue at an accelerated pace but will be subject to a strict set of overall lease and permit stipulations which should provide significant consideration for most key wildlife resources. Critical bighorn sheep and elk habitat, undeveloped canyon habitats, woodlands, slopes greater than 40 percent, eagle and falcon nests, grouse dancing grounds and prairie dog towns will all receive some protection from minerals development. Most areas within the Forest have been leased in the past without adequate constraints. However, many of these leases are about to expire and will be subject to the more stringent standards proposed in the Plan. The No Surface Occupancy (NSO) stipulation will be imposed on key undeveloped wildlife areas such as Kinley Plateau and Bullion Butte, North Dakota. Other areas have been identified as low development areas. Given the fact that the FS has a legal obligation to allow existing oil and gas leases to be explored and developed, we believe that the Forest Plan is quite progressive in mitigating or precluding impacts to fish and wildlife resources in conflict with energy development. However, problems with some of the older leases will continue and should be dealt with on a case-by-case basis with coordination from the State and Federal wildlife agencies.

E

Although the management direction of the Forest Plan contains commitments towards wildlife resources, it comprises only the sideboards within which project planning and activities take place. The Plan does not provide specific details as to how the general goals and standards can be achieved. Therefore, commitments to wildlife interest are only as strong as the associated implementation plans at the District level. We cannot overemphasize the need for coordination with the State Game and Fish Departments and the Fish and Wildlife Service, and development of specific wildlife plans (e.g., raptors, elk, sheep, prairie dogs) for each District. We recommend these agencies be afforded the opportunity for input into other planning activities such as GAMP's and oil/gas lease/permit stipulations. We believe the FS should also strive to ensure adequate budgets for implementation of monitoring, evaluation and management plans affecting the wildlife program.

F

D Project level planning with public input will be an integral part of the implementation process (Chapter IV, Forest Plan).

E The Forest realizes that some older mineral leases do not contain the appropriate stipulation to mitigate and protect some surface resource values. However, the industry has been very receptive to on-the-ground negotiation in order to accomodate various surface needs identified by the Forest Service or State Fish and Game Departments. Until these leases can be updated with the appropriate lease stipulations based on the Forest Plan, we will continue to work with the industry on a case-by-case basis.

F The Forest Plan does not provide project level planning. The direction provided by the Forest Plan comprises the sideboards within which project planning and management activities take place. The Plan also defines management area goals and management standards that guide project activities toward achieving a desired future condition for that management area (Chapter II and III, Forest Plan). The project level activities that will aid in achieving the management area goals are listed for each management area (Chapter III, Forest Plan). Project level analyses such as those identified in Chapter IV will have to be developed to fully implement the Forest Plan. Public involvement will be a key in the development of the site specific area analyses that implement the Forest Plan.

Custer National Forest

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Threatened and Endangered Species

The FWS has completed formal consultation with the Regional Forester on the Custer Forest Plan. On June 10, 1985, FWS issued a biological opinion which concluded that the Plan will not jeopardize the continued existence of the threatened grizzly bear or the endangered gray wolf, peregrine falcon, bald eagle, least tern, whooping crane, or black-footed ferret. The piping plover, a species proposed for listing, was also considered appropriately in the Opinion and the Forest Plan. We recommend that these consultation results be included in the final EIS. G

Yellowstone National Park

Custer National Forest and Yellowstone National Park share approximately one mile of common boundary in the Beartooth Ranger District. We support the proposed plans to emphasize wildlife habitat protection in the Situation I Grizzly Bear Management Area by not planning logging, grazing, or road construction activities for this area. We realize that there are both patented and non-patented mining claims in the Situation I Area adjacent to the park. We ask that critical consideration for park resources and management be given any increased developments requiring Forest Service support associated with these lands. H

Theodore Roosevelt National Park

Portions of the National Grasslands adjoin Theodore Roosevelt National Park. The Park was set aside by an Act of Congress as a unique area of scenic, natural, and historical value. In addition to providing an ecological transition to and from wildlife habitat within the Park and a protective buffer for the Park's wilderness, the National Grasslands often provide a continuation of the Park's scenic vistas. We are concerned about the effects on the Park from past and future activities, and wish to stress the need to consider such effects in planning and decisionmaking for the Grasslands. I

Around the South Unit, many vistas which in the past had been unobstructed are now impacted by oil field structures, including production facilities and roads. Oil field activity close to the North Unit is just beginning. In order to protect the remaining scenic vistas, we urge that lands within the "seen area" of Theodore Roosevelt National Park be classified as Retention (not Partial Retention as proposed) and that such guidance be included in each of the appropriate Management Area sections. We believe this can be accomplished while accommodating mineral development by utilizing land forms, screening, and application of pertinent stipulation in land use permits. J

We are particularly concerned about the proposed assignment of several areas adjacent to the South and Elkhorn Units to Management Area E. We note that Management Area E lands are to be managed "to facilitate and encourage the exploration, development and production of energy and mineral resources. . ." and that "Conflicts that cannot be successfully mitigated will be resolved in favor of mineral development."

The Elkhorn Unit is located in an undisturbed area dominated only by ranching operations, a situation consistent with the significance of Roosevelt's Elkhorn Ranch. Extensive development, if without adequate safeguards for other resources values, would impair the undeveloped, peaceful ranching impressions of the area. K

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G These documents have been included as an appendix to the FEIS. Also, the piping plover has been added in the discussion of T&E species in Chapter II of the Final EIS.

H The area adjacent to Yellowstone National Park is Management Situation I for grizzly bear habitat management. The forest-wide management direction and the direction for this portion of Management Area C (Chapter II, and Chapter III, Forest Plan) provides adequate consideration for the Greater Yellowstone Ecosystem.

I No doubt the greatest chance of impacts on the Park would come from mineral related activities on the visual resource and the solitude offered by the Park. The Forest has in the past and will continue to consider the potential impacts to the visual quality and the solitude offered by the Park in the siting of oil and gas related facilities.

J As part of the Forest Plan analysis of impacts of oil and gas development on the visual resources, the "seen area" of the South Unit of the Theodore Roosevelt Park was mapped. This mapping was done from the portions of the Park that receive the majority of the use. This analysis resulted in a very small area being determined as "seen area". Partial Retention will result in management activities remaining visually subordinate to the characteristic landscape. This Visual Quality Objective (VQO) and other visual management considerations such as screening, painting of facilities, and utilizing land forms will protect the visual quality of areas adjacent to the Park.

K The area immediately adjacent to the Elkhorn Unit of the Park lies in Management Area B. The VQO of Retention is assigned to the "seen area" of the Little Missouri Scenic River. A No Surface Occupancy stipulation will be applied to mineral leases within the "seen area" of the Theodore National Park if this VQO cannot be met by using conventional methods (Management Area B, Chapter III, Forest Plan).

Two areas adjacent to the South Unit are proposed for Management Area E. Both have already experienced heavy development. One area is immediately adjacent to the west park boundary, which bounds the Theodore Roosevelt National Wilderness Area, so declared by Congress in 1978. Many of the values for which the Wilderness was set aside have been compromised by oil field development.

We recommend that these "E" category lands be assigned to a different management category, such as Management Area B, or that the Management Area E direction be revised to apply the specific energy/minerals guidance of Management Area B (with a VQO of "Retention") to these "E" areas adjacent to the Park.

For all areas adjacent to the Park, we urge incorporation of the following mitigating measures:

1. Mufflers on new, gas powered pump engines.
2. Use of electric pump engines.
3. Use of submerged or down-hole pumps.
4. Off-site, hidden production facilities.

We are also concerned about the extensive use of pesticides on lands adjacent to Theodore Roosevelt National Park because of the ecological changes that may take place due to residual or "spill-over" effects.

Although high populations of grasshoppers and Mormon crickets can be very destructive to the range forage production available to livestock, aerial spraying of insecticides is not always the best control technique. Instead, we urge the Forest Service to work with the North Dakota Animal and Health Inspection Service to develop an Intergrated Pest Management approach.

In addition, when treatment is required the use of biological controls should be instituted and chemical control used if needed. The National Park Service has used biological controls in Colorado and Utah on grasshoppers and Mormon crickets with good results when applied at appropriate insect life stages and within a few days after the preparation of the biological materials.

Finally, we request that the Plan's Management Standards be expanded to explicitly provide for consultation with the Park Superintendent, on a case-by-case basis, for those proposed actions affecting the Park.

Standing Rock Sioux Reservation

Portions of Management Area B are located within or near the exterior boundaries of the Standing Rock Sioux Reservation. Management of these adjoining surface/subsurface estates by two governmental agencies requires direct communications and coordination between the Bureau of Indian Affairs (BIA), Forest Service, and the Tribe. We believe there is a real need to establish policy and procedures for future management of these acreages. The following comments are addressed on an item by item basis as outlined in the Plan (Chapter 3, Page 7):

- Recreation: For those acreages on the Standing Rock Reservation, coordination with the Agency Superintendent for development of management plans concerning

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L Most of these mitigating measures are standard operating procedures on the Little Missouri National Grasslands. While technologically feasible, the use of submerged or down-hole pumps generally creates a major maintenance problem which could necessitate a high frequency of maintenance equipment being moved in and out of the area. This could cause more of a visual and noise impact than it would cure. The Forest will continue to rely on using noise reduction devices, electric pump engines where possible, and using screening or off-site production facilities as a means of mitigating visual impacts.

M The Forest in cooperation with the Animal Plant Health Inspection Service (APHIS) will pursue an integrated pest management approach on pesticide control projects on the Forest. Any proposed action must be evaluated through an environmental analysis procedure to determine the impacts other resources. The EA process provides for input by and consultation with the Park (Chapter II, Forest Plan).

N Although no specifically mentioned by name, the Park would be included in those agencies with whom the Forest will continue to coordinate and cooperate. (Minerals and Geology, 7.a.1. Chapter II, Forest Plan).

O The Forest will coordinate with the Standing Rock Reservation Agency Superintendent in the development of activity schedules necessary to implement the direction in the Forest Plan. However, our management perrogative does not extend to lands of other ownership. In terms of recreation, one of the most obvious things the Forest can do to assist recreationists is to adequately sign those areas adjacent to lands of other ownership (Chapter II, Forest Plan).

rights-of-way, trespass, ingress and egress and Law and Order (security) would minimize or eliminate the potential for future problems with non-reservation people traveling to or leaving from the Forest Service lands. O

- Wildlife and Fish: The Standing Rock Sioux Tribe has developed a Fish and Wildlife management code which is applicable to all trust lands within the exterior boundaries of the Reservation. For consistency of management plans, direct communications between the Tribe, BIA, and appropriate governmental agencies is necessary. P

- Range: Currently, there is little communication or coordination between the Forest Service and the BIA Agency at Ft. Yates, North Dakota. Issues of mutual interest such as coordinating surface lease sales, comparison of current surface lease provisions and practices, prevention and/or control of the spread of noxious weeds and insects, environmental erosion of the surface estate due to land use practices, coordination of stocking ratios, as well as monitoring of mineral exploration activities and protection of all cultural or religious sites, need to be addressed for the mutual benefit of the government and the Indian people. Q

- Minerals and Geology:

  a. Geophysical Operations: The BIA has developed its own permitting requirements. The environmental, seismic operations should be coordinated on seismic lines which extend from a governmental tract of land to an Indian tract. Depending on the Reservation and/or Agency, the BIA stipulations are generally more stringent than standard surface requirements maintained by other governmental agencies. R

  b. Oil and Gas Operations: Due to variances among governmental agencies on practices and procedures for mineral exploration and development, coordination and communication between the Forest Service and BIA is required. By coordinating lease sales, comparing environmental stipulations, and jointly developing a management plan, there is a potential to increase the economic return to the Government as well as protecting the environment. S

Crow Indian Reservation

The proposed action plan for the Beartooth Ranger District seems very acceptable. This alternative allows for grazing and mineral/energy development or use on the forest adjacent to the Crow Indian Reservation. In reference to the mineral aspect of the plan, development on the reservation will not be curtailed by proximity to the forest and vice versa. Mineral structures and producing lithologies may run beneath both surface types. As such it may be beneficial for the Crow Tribe to abut this type of forest management. T

Northern Cheyenne Reservation

The Ashland District is isolated from the Northern Cheyenne Reservation by several miles. Therefore, the designation of a dominant portion of the forest "adjacent" to the Cheyenne Reservation as roadless will not be beneficial or detrimental to the tribe.

The timber sales in a large portion of the forest north of Highway 212 and on the eastern side of the forest may have an adverse affect on timber sales and marketing within the Northern Cheyenne Reservation. Sales on forest land could serve to satisfy market requirements from that area and could possibly provide sufficient timber to fully supply mill needs at the Ashland and Lame Deer sites. U

P The Forest is responsible for managing the habitat associated with wildlif but does not set bag limits of seasons of use (hunting). The Forest will coordinate with the agencies involved but not assume the authority held by either the State or the Native American Tribes.

Q See response to Comment M above.

R The Forest will coordinate with the Standing Rock Reservation Agency on ar oil and gas operations. As previously stated, our management authority does not extend to lands of other ownership.

S See Response R above.

T No response is necessary.

U Due to the depressed market conditions within the timber industry, the Ashland mill has had to close. This has left the Forest Service as well a the Northern Cheyenne Tribe in a more tenuous situation as far as a market for timber products. Over the last few years very little timber has been cut from the Ashland District except for some small sales. It appears tha significant future volumes of timber from the Ashland District will probably be sold in mills in South Dakota. The Forest will continue to cooridinate with the Northern Cheyenne Tribe, especially in the area of timber marketing.

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We request that the U.S. Forest Service actively seek the input and comments of the Northern Cheyenne Tribe, inasmuch as this Reservation is either adjacent to or in close proximity to the proposal.

U

Mineral Resources

The wide distribution of lands in the Custer National Forest results in a broad range of rock types, geologic environments, and potential for mineral occurrences. Significant deposits of locatable, leasable, and salable minerals are all known to occur within the Forest. Of chief importance are coal, oil and gas, and the strategic minerals chrome, nickel, and platinum. Coal mining under Custer National Forest lands is currently banned by the Surface Mining Control and Reclamation Act of 1977, but studies have identified over 63 thousand acres underlain by coal within 200 feet of the surface (EIS, IV-64). Oil and gas from about 700 producing wells, largely within the Little Missouri National Grasslands portion of the forest, satisfies about 0.27 percent of the annual national demand (EIS, IV-55). Forest lands in the Beartooth Mountains in Montana include the highly mineralized Stillwater Complex containing the nation's largest known platinum and chrome deposits and the second largest nickel deposit (EIS, IV-64).

We believe this Plan dismisses the prospect of mining coal without adequate analysis. Although the Custer National Forest is precluded from surface mining by SMCRA, there remains considerable potential for underground coal mining. This potential should not be dismissed without analysis and rationale.

The plan states that the only mining permitted would be "bypass coal" in a Logical Mining Unit (LMU). Since there are no mining operations and no LMUs there will be no "bypass" situations. The plan precludes new mines and LMUs because of the intermingled federal and private coal ownership (see p. II-41 f. 1 and 2 for statements which preclude mining).

V

Regarding the Little Missouri National Grassland, the Plan and EIS make reference to areas with coal development potential and the application of the coal unsuitability criteria but do not specifically identify coal deposits or areas acceptable for further study. The Plan and EIS should present the results of the application of each of the four coal screens (43 CFR 3420.1-4(e)) to be completed during land use planning for lands subject to leasing. Lands which have passed through the coal development potential, unsuitability criteria, multiple-use tradeoffs, and surface owner consultation screens should be mapped in the document.

We would like to see a thorough discussion of coal resources, potentially viable mining areas, relationship between federal and private coal within the forest, and the coal development realized or foregone by the various alternatives.

W

Subsequent versions of the EIS should point out the critical/strategic nature of platinum, chrome, and nickel for industrial and defense purposes in addition to the size and importance of the deposits. Also, the Sioux Ranger District has a greater mineral potential, particularly in bentonite and zeolite minerals, than indicated by the study.

X

Regarding removal of mineral materials for road building or maintenance in the Tracy Mountain-Moody Plateau or Bullion Butte-Ponderosa Pine Areas (Chapter III-page 22), we urge that such material be obtained from other areas of the Grasslands which have already been heavily developed, to retain the limited development character of these areas, and concentrate extraction impacts in heavily developed areas.

Y

V Although not apparent, the analysis with respect to coal considered only surface mining. At present there are no underground coal mines within either the Fort Union or Powder River Coal Regions nor does it appear that, in any way, an underground mine in either Region could compete economically with surface mining. Additionally, it does not appear that this condition can be expected to change even in the long-run or during the next 10-20 years. Therefore, underground mining was not preceived as a viable option to consider. Furthermore, the Custer National Forest has not been notified of any interest in underground coal mining on any Ranger District. If such need is shown in the future it will be considered in the next planning period.

Again, the analysis was confined to surface mining. Therefore, since lands within the Montana portions of the Custer National Forest are precluded from surface mining operations the opportunities for the designation of Logical Mining Units (LMU's) was viewed to be severaly limited, that is, because it was considered highly unlikely that a private inholding of coal one square mine in size could be developed into an LMU without leasing of adjacent Federal coal. As a result, it was felt no further consideration of potential coal mining within the Montana portions of the Forest was necessary. With respect to the National Grassland portions of the Forest, it was decided that leasing of these areas could be considered further when, and if, a interest in leasing was received by the Department of Interior (see additional discussion below).

W Because of an apparent lack of interest in coal leasing on the Little Missouri National Grasslands (LMNG) it was felt that inclusion of the "unsuitability analysis" in the Forest Plan itself was not warranted. However, as noted in the DEIS (p. IV-64) an analysis has been conducted and perhaps it should be somehow noted in the Plan that this analysis is part of the "planning record" and is available for any interested party to inspect. Owing to the current and projected (next 10-20 years) "soft" coal market it was not considered necessary to go into great detail with respect to resources, potentially viable mining areas, etc. The resource data that was felt necessary can be found on p. III-43 of the DEIS.

X While it is true that the stratigic nature of platinum, chrome and nickel was not specifically mentioned in the DEIS the overall significance of these deposits in the Stillwater Complex was not overlooked. This will be rectified in the Final Environmental Impact Statement by noting that these metallic substances possess strategic importance as noted by the U.S. Bureau of Mines.

Our source of information for bentonite resources (Knechtel, M.X., and S.H. Patterson, 1962, Bentonite Deposits of the Northern Black Hills District Wyoming, Montana, and South Dakota: U.S. Geological Survey Bulletin 1082-M, 1030 p.) indicated that any bentonite present on the Sioux Ranger District was too deeply buried to be economically minable.

We have no knowledge of commerical zeolite mineral occurrances in southeastern Montana or northwestern South Dakota.

Ground Water

The Statement and Plan should discuss the typical occurrence of ground water and evaluate the potential for ground-water impacts from silviculture, grazing, and recreational use as well as from permitted activities such as oil and gas production. The evaluation should include the use and control of the 82 artesian wells, 496 nonartesian wells, and more than 800 springs listed on page IV-69 of the statement. Is artesian pressure being conserved? What measures are taken to protect the quality of ground water at wells and springs and in recharge areas? Procedures for maintenance and abandonment of wells to sustain and protect aquifers against degradation of quality and loss of artesian pressure should be summarized. Periodic monitoring of drinking water for visitors and the staff and water-quality standards should be addressed. The effects on ground water of the intensive development of oil and gas and mitigative measures should be considered more adequately, including accidental hydraulic fracturing of aquicludes or aquifers, contamination of aquifers from brines, oil, fuels, chemicals, or pesticides via spills or leaks in casings, pipelines, or tanks. Requirements for emergency spill plans should be considered. Standards or regulations for construction and operation of injection wells for secondary recovery or brine disposal should be included in the assessment of impacts and mitigation.

Air Quality

The air quality of western North Dakota has experienced some degradation in recent years from energy development and production. Oil and gas extraction in the areas surrounding Theodore Roosevelt National Park has resulted in decreased visibility from smoke, dust and other particulate matter, olfactory pollution from sulfur gases, and visibility/aesthetic degradation. The Plan emphasizes air quality monitoring under most Management Area plans. We believe this is a positive start toward measuring effects on the air resources. We encourage the Forest Service to coordinate their program with those of the North Dakota State Department of Health, U.S. Fish and Wildlife Service, and National Park Service, agencies which have been involved in air quality research and monitoring since at least the mid-1970's and have substantial data bases and expertise.

Recreation

Only 39 acres, out of over one million, are proposed for developed recreation areas on the Little Missouri National Grasslands, representing no change from the present. It seems that a few additional camping areas with minimum facilities would be desirable. Given the intermingled private, State, and Federal ownership of the area, many visitors are unsure of the location of lands available for hunting, hiking, and camping. If designated sites were available, the public would more likely utilize the Grasslands without having to worry unnecessarily about trespass. In addition, National Park campgrounds are not available as hunting base camps; thus a shortage of available designated camping areas occurs during hunting seasons. Likely areas for additional campgrounds would be on the periphery of Essentially Roadless Areas or on the periphery of lands to be managed under Management Areas C, D, F, J, K, or M.

National Rivers Inventory

Neither the Forest Plan nor the EIS give evidence that the Nationwide Rivers Inventory (NRI) list was checked as required by the Federal Register notice of September 8, 1980, (45 FR 59190) to determine whether the Plan could affect an inventory river. The Little

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Y The potential use of materials from sites in these areas was included in order to provide for public safety in an economical manner. It was felt that use of sites in these areas would result in no more impact than developing new sites in other areas that which would require longer hauling distances and, hence, increased project costs. In addition, the management emphasis for these areas was directed toward wildlife considerations, not for any roadless characteristics that the areas might contain. Therefore, it was felt that mineral material extraction could be conducted in a fashion that would be compatable with the management goals of the areas in question.

Z The Forest-wide management direction (Chapter II, Watershed (Soil and Water Resources), Air Quality has been expanded to address these concerns.

We have added discussion regarding protection of freshwater aquifers, particularly the deeper Fox Hills aquifer, and how drillers must protect it while drilling, producing, or reinjecting brine water through it. We have also added discussion of impacts caused by other types of resource management activity.

Note that the Custer National Forest has a Contingency Plan to place in operation during oil or gas well emergencies.

AA We believe this subject is adequately addressed in the section beginning on Chapter II page-37 of the Draft Land Management Plan. This portion of the Plan is already being done through coordination with the agencies named.

BB Additional analysis conducted between the draft and final EIS indicated that the demand for developed recreation is not sufficient to warrant increased capital investment for developed sites. In 1985, developed sites on the Little Missouri National Grasslands only averaged 15%-20% use of theoretical capacity. No doubt use is somewhat higher during bird hunting season, but it is not economically feasible to construct additional sites to meet the short period of peak demand. In order to meet this period of peak demand, the season of use for some sites can be lengthened. Privately owned campgrounds are also available. Also, the National Grasslands are open for "throw-down" camping which is generally popular with hunters. The management direction in the Final Forest Plan provides for the construction of the North Country National Scenic Trail. According to the 1980 State Comprehensive Outdoor Recreation Plan (SCORP) for the State of North Dakota, trails are the number one priority for recreational needs in the State (See 1980 SCORP, North Dakota).

Missouri River in North Dakota would appear to be affected by the proposed Plan, and this river is included in the NRI. A copy of the Federal Register notice and the appropriate excerpt from the NRI are enclosed.

The Plan and EIS should determine whether or not the proposed action would have an adverse effect on the natural, cultural, and recreational values of the Little Missouri River. If not, such a finding should be made a part of the final document.

However, if it is found that the proposed action would have an adverse effect on the values listed in the NRI, the Plan and EIS should determine whether the proposed action could foreclose options to classify any portion of the inventory stream as a wild, scenic, or recreational river area. The Plan and EIS should then identify the adverse impacts and give any mitigation or avoidance measures which could be incorporated into the proposed action. Further assistance on NRI procedures may be obtained from Mr. Duane A. Holmes, National Park Service, Rocky Mountain Regional Office, 655 Parfet St., P.O. Box 25287, Denver, CO, telephone (FTS) 776-8705 or 303/236-8705.

CC

CC Additonal analysis conducted between the Draft and Final EIS has been incorporated into Chapters II, II and IV of the EIS concerning the effects on the Little Missouri State Scenic River. Forest-wide management direction and the management direction for Management Areas B, C, and D has been strengthened to preclude any adverse effects on the natural, cultural, and recreational values of the Little Missouri River.

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National Natural Landmarks (NNL's) and National Recreation Trails (NRT's)

No discussion was found in the subject document which took into account the existence and/or the effect the proposed Forest Plan and EIS would have upon NNLs. It is, therefore, recommended that the Forest Service address NNL areas as part of their natural resource management activities. The following NNLs, listed by State and county, are located within the Custer National Forest:

Montana

Carbon County - 4

Beartooth Glacial Landscape	Potential NNL
Big Ice Cave	Potential NNL
Crooked Creek Karst Canyon	Potential NNL
Lost Water Canyon	Potential NNL

Carter County - 1

Capitol Rock	Registered NNL

Stillwater County - 1

Granite Peak Glaciers (Park and Carbon Counties)	Potential NNL

Sweetgrass County - 1

Stillwater Ultramafic Complex	Potential NNL

South Dakota

Harding County - 1

The Castles	Registered NNL

DD

DD Management Area O contains the management direction for the existing National Natural Landmarks (Capitol Rock, and the Castles) on the Sioux Ranger District (Chapter III, Forest Plan). Approximately 1,247 acres are included within this management area. The management direction for this area has been expanded to include the four National Recreation Trails. The Forest does not see a need to include any potential NNL's in this Management Area.

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North Dakota

Ransom County - 1

Sheyenne Sand Hills Potential NNL

The Plan should also recognize the following 4 National Recreation Trails (Montana).

Basin Lakes Trail	(3.75 miles)
Parkside Ski Touring Trail	(8.14 miles)
Silver Run Ski Touring Trail	(6.8 miles)
Wild Bill's Lake Trail	(.5 miles)

Information on the NNL and NRT programs can be obtained from Ms. Carole A. Madison, National Park Service, Rocky Mountain Regional Office, 655 Parfet Street, P.O. Box 25287, Denver, CO, telephone 303/236-8699 or FTS 776-8699.

DD

Wilderness/Roadless Areas

Through the previous Rare II evaluation process, approximately 26 roadless areas were identified. All of the original designated roadless areas in Montana have been retained in the Forest Plan as either a roadless area, low development area (Management Area J), or wilderness area. For most of those in North Dakota, the name "Essentially Roadless Area (ERA)" is no longer applicable because of existing oil and gas development, transportation networks, structural range improvements, or proposed leasing and development.

EE

However, the Bennett-Cottonwood and Lone Butte areas still retain sufficient unspoiled characteristics and are proposed as low development areas. We concur in this designation. Other original ERA's (e.g., Twin Buttes, Kinley Plateau) with similar characteristics are not proposed for similar status. We recommend that the FS give additional consideration to these areas for either low development, roadless or wilderness status.

We believe that roadless areas are essential in maintaining the character of the Little Missouri Badlands, given the extensive past, current and anticipated development. Roadless areas, if properly managed and protected, are important for primitive recreation and undisturbed wildlife habitat, yet can provide livestock forage, watershed protection, and mineral extraction under No Surface Occupancy stipulations. We urge that any current or future oil and gas extraction in roadless areas should be conducted under No Surface Occupancy stipulations. Presently, some roadless areas are being altered by gradual oil development across them, as no stipulations for protecting these roadless areas have been applied.

There are several areas within the Medora Ranger District which were classified as a roadless area in the 1974 Management Prescription for the Badlands Planning Unit. They are: the Bullion Butte area, the Wannagan Creek area, and the Twin Buttes area. Some development has occurred in these areas, but the remaining undeveloped areas should be preserved, allowing for traditional grazing uses. We urge that these be added to the Roadless Areas designation.

FF

EE Although the concept of "essentially roadless areas" has been dropped in the Forest Plan, the Forest is not doing away with the roadless resource concept. The roadless inventory will be tracked over time, however, the management of those lands will provide for other uses and the terminology "low development areas" will be used.

FF The level of oil and gas development and the potential for impacts on other resources remains one of the major issues for the Custer National Forest and our publics. This issue as it relates to the management of roadless areas generated more public responses to the Draft Forest Plan and EIS than any other issue. In response to the public comments, the Forest completed additional analysis of management options as they relate to minerals management within roadless areas. The criteria analyzed were mineral ownership, surface ownership patterns, lease status, and mineral potential. The Forest also considered the public support for roadless areas. The Final Forest Plan and FEIS recommends three additional areas or approximately 30,000 to be managed for Low Development (Roadless) management. These areas are Twin Buttes, portions of the Horse Creek Roadless Area and Long X Divide, an area identified as roadless and having significant wildlife habitat values. This would result in approximately 44,000 acres of the 120,000 in North Dakota remaining in a "roadless" status. The remaining areas such as Wannagan, Bullion Butte, Strom Hanson and Kinley Plateau have mineral leases held by production and surface/subsurface ownership patterns that could preclude managing these areas in a roadless condition.

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General

The Plan is an extremely complex document, and therefore, difficult for the reader to follow or comprehend. One reason for this difficulty is the large number of alternatives. We would make the following suggestions for improvement:

1. Reduce the number of alternatives by combining those which are similar. Clearly identify which is the "No Action."

2. Reduce the number of management areas by combining those which are similar. In the legends of the associated maps, recapitulate the essence of the management theme for each management area.

We suggest including an explanation of how National and regional guidance is reflected in the Plan. This would help the reader understand the different organizational levels associated with forest planning and clarify the levels at which decisions are made. It might be helpful to use a schematic diagram in the introduction to the Plan showing how this process works.

Decisions embodied in the Plan are sometimes hard to find and focus on because one is unsure whether they are "goals," "objectives," or "projected outputs." This might be clarified by the use of editorial highlighting techniques or simply calling "proposed decisions" by that name.

We appreciate the opportunity to comment on the proposed Plan. Additional, specific comments on the Plan and EIS are enclosed.

Robert F. Stewart

Robert F. Stewart
Regional Environmental Officer

Enclosures

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II

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GG The large number of alternatives was necessary to sufficiently analyze a adequate range of market and nonmarket outputs. Alternative 5a, 5b, 5c, 6a, 6b, 7a, 7b, and 7c were formulated specifically to analyze different levels of wilderness and roadless management emphasis.

HH Although some of the management areas are similar in some respects, there are significant differences in portion of the management direction. The Forest sees no way to reduce the overall number of management areas. The description at the beginning of each management area give a brief summary of the essence of each area.

II A national and regional perspective to the Forest Planning process in included in the Draft EIS (Chapter I, EIS).

JJ The goals, objectives, and projected outputs are not decisions in and of themselves but the results of the anaysis documented in the EIS. The major decisions and the rationale for those decisions are documented in the Record of Decision accompanying the Final EIS and Forest Plan.

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SPECIFIC COMMENTS

DRAFT LAND AND RESOURCE MANAGEMENT PLAN

Chapter II, page 14, paragraph 3, line 5. "Better" is not a standard range condition term. KK

Chapter II, pages 27 and 28 - The FS has included in the Plan some excellent general mitigation standards for protection of raptors and should be complimented. These standards will help protect nesting raptors outside of Management Area C and D (where conflicts will be resolved in favor of wildlife). However, we suggest these standards be considered as guidelines, not absolutes, and should be tempered by site-specific monitoring of conflict nests at the District level in cooperation with the FWS. In North Dakota, the FWS has excellent rapport with the FS on raptor/oil and gas conflicts and believe that stipulations used to date have allowed development to proceed without compromising the biological integrity of raptor nesting territories. The key has been the close coordination between the two agencies. LL

On the basis of case studies and current information, we believe the critical timing periods for falcon and merlin nesting should be changed to include "March 15-July 15 or fledging." In addition, we support the concept of NSO near eagle, falcon or merlin nests, but believe that one-quarter mile may not be sufficient protection for nests or eyries in rather open terrain. We generally recommend one-half mile as a guideline but the distance factor must be assessed on a case-by-case basis and varies depending on the species, line of sight, noise factor, and time and type of development. MM

Chapter II, page 31, b. Range Administration, lines 5-6. Please explain the terms "private land permits" and "on and off permits." NN

Chapter III, page 1, paragraph 2, line 5. Describe the amount of flexibility in the management area boundaries. OO

Chapter III, page 9, section b (2). Is 200 feet enough buffer for grouse dancing grounds? BLM normally requires a one-half mile buffer. PP

Chapter III, page 53, section 5.C.1. We question the inclusion of the qualifying word "justifiable" in this sentence since the 1872 mining law provides the justification when an access road is necessary to maintain the claim and to remove minerals. QQ

Chapter III, page 59 - Deer Draw is a candidate for designation as a Research Nautral Area (RNA). It may contain the habitat type of special faunal populations. The special faunal populations should be identified. RR

Chapter III, pages 75-76. We fully concur with your description of management direction for Management Area Q, which contains part of the Pryor Mountain Wild Horse Range. SS

Chapter IV, page 2 - Several documents to provide further guidance to FS management activities "under the umbrella of" the Forest Plan are listed. These documents are in various stages of completion. Of immediate interest to the FWS is the document entitled Raptor Management Guidelines. We would appreciate the opportunity to have input into the development of these guidelines or review the document if completed. The FWS has developed a standardized raptor database called "RAPTOR" and have been refining recommendations and stipulations used in the management of raptor/development conflicts. We believe this information would be beneficial in the development of FS guidelines for raptor management which would be consistent with those of other land and resource management agencies within the Department of the Interior. TT

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KK As pointed out the term "better" is not a standard range condition term. This has been corrected in the Final Forest Plan.

LL The management standards and guidelines are not viewed as absoulutes but serve to guide or outline the management direction for an area. The Monitoring and Evaluation Plan (Chapter IV, Forest Plan) defines the variability allowed in the application of management guidelines beyond which further evaluation would occur.

MM The timing periods for falcon and merlin nesting has been changed to include "or fledging (Chapter II, Forest Plan).

The past experience of the Forest and input from wildlife biologists indicate that, in general, NSO stipulations within one-quarter mile is sufficient to protect eagle, falcon or merlin nests. These must be assessed on a case-by-case basis depending on several important factors such as those you point out.

NN The terms "private land permits" and "on and off permits" have been added to the glossary of the Final Forest Plan.

OO It is not possible to absolutely quantify the degree of flexibilty in management area boundaries. These boundaries are based on the mapping of habitat types and ecosystems that was accomplished as part of previous planning efforts on the Forest. As implementation of the Plan progress, no doubt much of this information will be refined and obviously some errors will be uncovered. The Forest will retain the flexibility to adjust boundaries to fit on-the-ground conditions as determined by updated information. It is not the intent of of this section to grant "carte blanche" authority to the Forest to change boundaries in order to do something. The integrity of adjacent management areas, projected Forest outputs, and the overall management direction of the Forest will be maintained.

PP The Forest has been modifying the standard BLM mineral stipulation as it pertains to grouse dancing grounds. Based on information and general observation by district wildlife biologists, 200 feet has been an adequate buffer.

QQ The word "justifiable" has been deleted.

RR The special faunal species in this area is undetermined at this time.

SS No response is necessary.

TT The Fish and Wildlife Service will be given ample opportunity to review and have input into the Raptor Management Guidelines. No doubt their information will be most benefical in developing these guidelines.

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Chapter IV, pages 8 and 11, Table IV-2 - Upon examination of the wildlife section of the Monitoring Action Plan, we noticed several things relative to the monitoring of riparian and woody draw areas that cause some concern. First, funding levels for implementation of the various monitoring items are omitted from both Table IV-2 and the text. Second, we think that the levels of variability listed for monitoring items C4 and F4 are less sensitive than desired and should be altered or clarified to consider cumulative losses of habitat over time. Third, because of the high value of the riparian and woody draw areas, we feel that the percision, reliability, frequency and reporting period should also be restructured. These monitoring efforts should be in keeping with the intent of both E.O. 11990 and Forest Policy. UU

As currently planned, a substantial decrease in acreage (up to 10 percent over each 5-year period) and quality of riparian habitat, woody draws and wetlands could occur over the life of the Plan without further evaluations being initiated. An increase of 10 percent or more (over a 5-year period) in acres showing a downward trend in watershed condition would have to occur before further evaluation would be initiated. We do not belive this is keeping with the intent of E.O. 11990 or Forest Policy.

We recommend that the level of sensitivity be increased such that long- and short-term destruction, loss or degradation can be avoided, as is stated in the Forest Policy. We strongly recommend that a riparian/woody draw/wetland analysis package be designed, funded and implemented. Such a package could serve as a data source from which comparisons may be made over time. VV

Appendix VII, page 1 - Please note that on the piping plover has been proposed for listing as a federally threatened species in North and South Dakota and Montana. Reference the previous DEIS specific comment for Page III-30, Table III-10, on the prairie fringed orchid and the Adler's tongue fern. XX

Appendix VII, page 1 - Our comments on Management Indicator Species (page III-29 of the DEIS) are also pertinent to this section.

Appendix VII, page 4 - Include the Grand River Cedar River National Grasslands as portions of the Forest that underlie the migration routes of whooping cranes. YY

Appendix VII, page 6 - Antelope should have consideration as a major interest species in the Grand River National Grasslands. ZZ

Appendix VII, page 7 - Our comments on the elk management plan for the Little Missouri Grasslands (page III-35 of the DEIS) are also applicable to this section. AAA

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Page II-80. Table II-9. We do not find any discussion, reference, or quantitative definition of the potential categories used in this table. We particularly question the meaning of the "very high" category. For oil and gas resources, this might reflect the acreage of Known Geologic Sturctures (KGSs). BBB

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UU There has been considerable confusion surrounding the Monitoring and Evaluation Plan portion of Chapter IV, Forest Plan. The correct interpretation of Monitoring Item C4 is that further evaluation would be initiated when more than a 5% reduction (cumulative by Management Area) in effective acres by managemetn area occurrs within the life (10-15 years) of the Forest Plan. Monitoring activities such as inventories, range analyses, and project analyses would be conducted with emphasis in key wildlife habitats in each management area. The findings of these surveys and/or analyses would be reported every 2 years as part of the monitoring and evaluation process.

The Monitoring and Evaluation plan has been restructured in the Final Forest Plan to include projected cost associated with each monitoring item and to reduce some obvious confusion.

VV Monitoring Item F4 has been modified to increase the sensitivity level. Also reference response to comment SS above.

XX The Piping plover and Interior Least Tern have been added to Table II-9 of Chapter III, EIS, and to the list of T&E species (Federal Listing) in Appendix VII, Forest Plan.

YY The Grand River Cedar River National Grasslands have been added in the discussion of areas possibly used by whooping cranes.

ZZ Antelope have been added to the list of major interest species in Appendix VII.

AAA The discussions on Elk in Chapter III in the Final EIS and in Appendix VII of the Final Forest Plan have been expanded to at least mention the adjacent habitat on BLM lands. Although our management authority does not extend to BLM lands, the Forest will continue to coordinate with the State of North Dakota and other agencies in the management of wildlife habitat (See Chapter II, Forest Direction, Forest Plan).

BBB This section has been expanded considerably in the Final EIS to clarify Table II-9.

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Page III-29 - The concept of Management Indicator Species is discussed and lists are provided for threatened and endangered species, sensitive species and major interest species. These lists, however, reflect very few of the species listed by the FWS as "Migratory Birds of High Federal Interest" or "Species of Special Emphasis." For example, sensitive raptors such as the golden eagle, prairie falcon, and ferruginous hawk are not listed by the FS. The FWS believes that these and other nongame species of special concern to the states of Montana, North and South Dakota should be included under the authority of the following National Forest Management Act (NFMA) regulation criteria: "species with special habitat needs that may be influenced significantly by planned management programs." These aforementioned raptor species are sensitive to developmental activities (e.g., oil and gas operations) and would be good indicators for evaluating mitigation and management programs. We believe this is consistent with the direction of the monitoring action plan (Chapter IV, Table IV-2, page 9) for special interest wildlife species (i.e, golden eagle, prairie falcon).

We recommend that the FS give consideration to including these species into the planning document lists and that key areas for these species be identified on the Forest and protected.

Page III-30, Table III-9 - On May 28, 1985, the interior least tern was officially listed as a federally endangered species in North and South Dakota and Montana, and should be added to the federal list of threatened and endangered species in this table. The piping plover has been proposed for listing as a federally threatened species in the same three states.

Page III-30, Table III-10 - The prairie fringed orchid and the Adder's tongue fern are listed as threatened or endangered plants. It is unclear whether this reference is to a state or federal listing. For clarification purposes, neither species is on a federal list. The prairie fringed orchid is considered a Category 2 candidate species for the federal list and is undergoing a status survey. The Adder's tongue fern is not a candidate species.

Page III-34 - Relative to the discussion on the black-footed ferret, a confirmed black-footed ferret skull was found in 1980 on a prairie dog town within the Forest proclamation boundary. This town was on state lands in Section 36, T. 137 N., R. 100 W, Billings County, North Dakota.

Page III-35 - The discussion on elk references the cooperative development of an elk management plan by the FS and North Dakota Game and Fish Department (NDGFD) for a herd of elk on the Little Missouri National Grasslands. The high use area of the elk encompasses the Bureau of Land Management's (BLM) Lost Bridge Management Unit (approximately 15,000 acres), as well as considerable acreage within the McKenzie Ranger District. The BLM is currently preparing a statewide Resource Management Plan which will include an elk management plan. Because of the significance of the elk population, the rugged badlands habitat, overlapping agency responsibilities and potential oil and gas impacts, we believe that the FS/NDGFD elk management plan should also be coordinated with the BLM. The FWS believes that unilateral management of either the elk or oil and gas resource will lead to unnecessary and sometimes unresolvable conflicts. The development of a cooperative management plan will provide direction for more appropriate management of these resources.

Page IV-55 (and following), section AA. Minerals 1. Oil and Gas. This is one of the best oil and gas operational discussions among the Forest Service plans we have seen.

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CCC The Forest has tried to key on one or at most two indicator species for specific habitat types across the Forest. We realize that there are oth raptors, game and nongame species that could be listed as management indicator species and that are important to the different States and Federal agencies as well. The Forest has chosen to list these species i Appendix VII of the Forest Plan (See Appendix VII, Forest Plan).

DDD The discussion of T&E species in the Forest Plan and Final EIS has been expanded to include the interior least tern and the piping plover.

EEE The discussion in the Forest Plan and Final EIS relative to the prairie fringed orchid and the Adder's tongue fern have been corrected.

FFF No response is necessary.

GGG Reference response to Comment AAA above.

HHH No response is necessary.

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Specific Comments (Custer)

Page IV-64, section 2. Locatable Minerals. We suggest more attention to the consequences of locatable mineral development along the lines of the oil and gas treatment. III

Page IV-64, paragraph 2, line 9. There is a technical misstatement here regarding determination of mining claim "validity." Only a hearing judge can determine the validity of a mining claim. A mineral examination is conducted by the federal land management agency to determine whether or not the claim has a discovery. JJJ

Page IV-64, section 3. Coal. We would like to see the coal discussion strengthened. For example, under what circumstances might it be "deemed necessary" to initiate further study of coal resources. We would also like to know why the option of developing underground coal mines in the Ashland Division is not considered although abundant resources exist (Table III-17). KKK

Appendix B, Pages 89-93. We suggest that references be provided for the social measures presented. LLL

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III The discussion pertaining to the environmental consequences of locatable minerals in Chapter IV has been expanded considerably in the Final EIS.

JJJ The Forest does not agree that this is a "technical misstatement". Although the primary purpose of a mineral examination is to determine whether or not the claim has a discovery, it can and does determine claim validity in some cases. Unless the contestees file an answer to the minerals complaint within thirty days after service of the Notice and Complaint, the complaint is taken as admitted and the case is decided without a hearing.

KKK At the present time there are no direct impacts or active coal mining on Forest lands. If, however, an adjacent mining unit was begun the Federal coal suitability would again be studied to preclude the possibility by bypassing Federal coal suitable for mining in a logical mining unit. At the present time there appears to be little interest in leasing of federal coal. At the present time there are no underground coal mines within either the Fort Union or Powder River Coal Regions nor does it appear that, in any way, an underground mine in either Region could compete economically.

LLL The references for this section of Appendix B were inadverently omitted. The following references have been added to Appendix B:

USDA, Forest Service 1981. A Survey of the Social and Economic Effects of Oil and Gas Develoopment--Little Missouri National Grasslands, Norht Dakota. USDA Forest Service Northern Region.

USDA, Forest Service 1981. Social and Economic Assessment of ...Oil and Gas Activities. USDA Forest Service Northern Region.

60 FR 10

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Executive Office of the President,
Council on Environmental Quality,
722 Jackson Place, NW., Washington, D.C.
August 11, 1980.

Memorandum for Heads of Agencies

Subject: Prime and Unique Agricultural Lands and the National Environmental Policy Act (NEPA)

The accompanying memorandum on Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act was developed in cooperation with the Department of Agriculture. It updates and supersedes the Council's previous memorandum on this subject of August 1976.

In order to review agency progress or problems in implementing this memorandum the Council will request periodic reports from Federal agencies as part of our ongoing oversight of agency implementation of NEPA and the Council's regulations. At this time we would appreciate receiving from your agency by November 1, 1980, the following information:

- identification and brief summary of existing or proposed agency policies, regulations and other directives specifically intended to preserve or mitigate the effects of agency actions on prime or unique agricultural lands, including criteria or methodology used in assessing these impacts.
- identification of specific impact statements and, to the extent possible, other documents prepared from October 1, 1979 to October 1, 1980 covering actions deemed likely to have significant direct or indirect effects on prime or unique agricultural lands.
- the name of the policy-level official responsible for agricultural land policies in your agency, and the name of the staff-level official in your agency's NEPA office who will be responsible for carrying out the actions discussed in this memorandum.

Gus Speth,
Chairman.

Executive Office of the President,
Council on Environmental Quality,
722 Jackson Place, NW., Washington, D.C.
August 10, 1980.

Memorandum for Heads of Agencies

Subject: Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory

In his second Message on the Environment, issued in August 1978, the President underscored the need to strengthen the National Wild and Scenic Rivers System and to take particular care not to harm rivers

which may qualify for inclusion in the System.

The President issued a directive on August 2, 1979 in conjunction with his Message which required that:

"Each Federal agency shall, as part of its normal planning and environmental review process, take care to avoid or mitigate adverse effects on rivers identified in the Nationwide Inventory prepared by the Heritage Conservation and Recreation Service in the Department of the Interior. Agencies shall, as part of their normal environmental review process, consult with the Heritage Conservation and Recreation Service prior to taking actions which could effectively foreclose wild, scenic, or recreational river status on rivers in the Inventory."

This memorandum is intended to assist your agency in meeting its responsibilities under the President's directive. A brief set of procedures is attached which provides guidance on how to integrate these responsibilities with your normal environmental analysis process under the National Environmental Policy Act (NEPA). The objective is to ensure that the President's directive is met promptly and efficiently.

Development along our rivers continues to outpace our ability to protect those rivers that might qualify for designation in the National Wild and Scenic Rivers System. The Heritage Conservation and Recreation Service (HCRS) in the Department of the Interior has been preparing a Nationwide Inventory of river segments that, after preliminary review, appear to qualify for inclusion in the System. It is therefore essential that federal agencies proceed carefully and limit any adverse effects of their actions on rivers identified in the Nationwide Inventory. Otherwise, the Inventory could be depleted before the identified rivers can be fully assessed to determine the desirability of including them as components of the National Wild and Scenic Rivers System.

Although the President's directive does not prohibit an agency from taking, supporting or allowing an action which would adversely affect wild and scenic values of a river in the Inventory, each agency is responsible for studying, developing and describing all reasonable alternatives before acting, and for avoiding and mitigating adverse effects on rivers identified in the Inventory. Where agency action could effectively foreclose the designation of a wild, scenic, or recreational river segment, the President has directed the agency to consult with HCRS. It is difficult to restore a river and its immediate environment once its wild and scenic qualities have been lost.

The purpose of this consultation requirement, which is meant to be part of the normal environmental analysis process, is to provide the opportunity for HCRS experts to assist other agencies in meeting program objectives without irreparably damaging potential wild, scenic, and recreational river areas. Consultation with HCRS should encourage better planning *at an early stage* in order to reduce resource management conflicts or to avoid them altogether. The consultation requirement also provides an opportunity to seek early resolution of problems by policy-level officials if necessary.

Completed portions of the Nationwide Inventory—those for the Eastern half of the country—were sent to you from HCRS Director Chris T. Delaporte on November 13, 1979. Forthcoming portions of the Inventory will be transmitted as they are completed. You should ensure that the list of rivers in the Inventory and the attached procedures receive wide distribution in your agency.

Copies of orders, guidance, or memoranda which you use to adopt or to transmit the attached procedures within your agency should be sent to the Council on Environmental Quality (Attention: Larry Williams) and to the Interagency Wild and Scenic Rivers Study Group (Attention: Jack Hauptman, HCRS, 440 G Street, N.W., Washington, D.C. 20243).

Gus Speth,

Chairman.

Attachment.

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Procedures for Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory

These procedures are designed to assist federal officials in complying with the President's directive (attached) to protect rivers in the Nationwide Inventory through the normal environmental analysis process. NEPA, E.O. 11514, CEQ's NEPA Regulations, and agency implementing procedures should be used to meet the President's directive.

Although the steps outlined below pertain to wild and scenic river protection, they also fit clearly within agencies' existing environmental analysis processes. Agencies are already required: to identify and analyze the environmental effects of their actions: to consult with agencies with jurisdiction by law or special expertise (in this case, HCRS); to develop and study alternatives: and to use all practicable means and measures to preserve important historic, cultural, and natural aspects of our national heritage.

The procedures outlined below simply link the appropriate elements of the normal environmental analysis process with the President's directive "to take care to avoid or mitigate adverse effects on rivers identified in the Nationwide Inventory." Federal officials should promptly take steps to incorporate the actions specified below into their planning and decisionmaking activities and the conduct of their environmental analyses.

1. *Determine whether the proposed action could affect an Inventory river.*

Check the current regional inventory lists to determine whether the proposed action could affect an Inventory river.

If an Inventory river could be affected by the proposed action, an environmental assessment or an environmental impact statement may be required depending upon the significance of the effects.

If the action would not affect an Inventory river, no further action is necessary under these procedures. (The agency is still required to fulfill any other responsibilities under NEPA).

2. *Determine whether the proposed action could have an adverse effect on the natural, cultural and recreational values of the Inventory river segment.*

Using the Guide for Identifying Potential Adverse Effects, which is appended to these procedures, you should determine whether the proposed action could *adversely* affect the natural, cultural, or recreational values of the Inventory river segment. Adverse effects on inventoried rivers may occur under conditions which include, but are not limited to:

(1) Destruction or alteration of all or part of the free flowing nature of the river;

(2) Introduction of visual, audible, or other sensory intrusions which are out of character with the river or alter its setting;

(3) Deterioration of water quality; or

(4) Transfer or sale of property adjacent to an inventoried river without adequate conditions or restrictions for protecting the river and its surrounding environment.

If you have prepared a document which finds that there would be no adverse effects—such as a Finding of No Significant Impact under the CEQ NEPA regulations—you should send a courtesy copy to the HCRS field office in your region.

3. *Determine whether the proposed action could foreclose options to classify any portion of the Inventory segment as wild, scenic or recreational river areas.*

In some cases, impacts of a proposed action could be severe enough to preclude inclusion in the Wild and Scenic Rivers System, or lower the quality of the classification (e.g. from wild to recreational). If the proposed undertaking would effectively downgrade any portion of the Inventory segment you should consult with HCRS.

Proposed actions (whether uses or physical changes), which are theoretically reversible, but which are not likely to be reversed in the short terms, should be considered to have the effect of foreclosing for all practical purposes wild and scenic river status. This is because a river segment, when studied for a possible inclusion in the Wild and Scenic River System, must be judged as it is found to exist at the time of the study, rather than as it may exist at some future time.

If a proposal, including one or more alternatives, could have an adverse effect on a river in the Inventory, an environmental assessment or, if the effects are significant, an environmental impact statement must be prepared. HCRS *staff* is available to assist you in determing the significance or severity of the effects in connection with your assessment, scoping process, and EIS, if one is needed. A detailed analysis of each of the rivers in the Inventory is available from HCRS for your use.

You should request assistance in writing from HCRS, as early as you can, providing sufficient information about the proposal to allow HCRS to assist you in determining whether any of the alternatives under consideration would foreclose designation. HCRS will in turn provide you with an analysis of the impacts on natural, cultural and recreational values which should enable you to make a determination as to whether or not designation would be foreclosed. HCRS is available to assist you in developing appropriate avoidance/mitigation measures.

When environmental assessments are prepared on proposals that affect Inventory

rivers copies should be sent in a timely fashion to the HCRS field office in your area before a proposed action is taken and while there is still time to avoid or mitigate adverse effects. When environmental impact statements are prepared on proposals that affect inventory rivers the lead agency should request HCRS and the affected land managing agency to be cooperating agencies as soon as the Notice of Intent to prepare an EIS has been published.

If HCRS does not respond to your request for assistance within 30 days, you may proceed with completing preparation and circulation of the environmental assessment or EIS as planned. Even where HCRS has been unable to comment on the environmental assessment or Draft EIS, you are still obligated by the President's directive to "... take care to avoid or mitigate adverse effects on rivers identified in the Nationwide Inventory . . ."

4. *Incorporate avoidance/mitigation measures into the proposed action to maximum extent feasible within the agency's authority.*

Any environmental documents prepared on the proposed action should identify the impacts on natural, cultural and recreational values, address the comments submitted by HCRS, and state the avoidance/mitigation measures adopted. Any disagreements will be resolved through existing procedures. For projects requiring environmental impact statements, the record of decision must adopt appropriate avoidance/mitigation measures and a monitoring and enforcement program as required by the CEQ regulations. (40 CFR 1505.2(c)).

A Note on the Meaning of "Federal Actions"

The above procedures are meant to apply to all federal actions that could adversely affect a river in the Nationwide Inventory (see Section 1508.18 of CEQ's NEPA Regulations (40 CFR 1508.18) for the meaning of "major federal actions"). For actions which are known in advance to require an environmental assessment or environmental impact statement these procedures would be followed in the normal course of NEPA compliance. If a federal action would not normally require an environmental assessment or an environmental impact statement, but could adversely affect a river in the Nationwide Inventory, the action should either (1) not be "categorically excluded" under agency implementing procedures, or (2) be considered an "extraordinary circumstance" in which a normally excluded action must be subjected to environmental analysis (see Section 1508.4 of NEPA Regulations).

The above procedures should be used for any proposals (including the evaluation of alternative courses of action) for which the NEPA process is not yet completed. The above procedures should therefore also be applied to a proposed modification or supplement to a previously authorized or implemented action.

For Further Information or Guidance

The HCRS regional office will usually provide the best source of information on rivers in the Nationwide Inventory and on specific ways that these rivers could be protected. For general assistance on policy and procedural matters, please contact the Chairman of the Interagency Wild and Scenic Rivers Study Group (202/343-4793), or contact the Council on Environmental Quality (202/396-4640).

Appendix I.

Guide for Identifying Potential Adverse Effects

The impact of a propose action should be assessed in relation to the eligibility and classification criteria of the Wild and Scenic Rivers Act. 16 U.S.C. 1271–1287, as amended.

In order to be eligible for inclusion in the National System, a river must:

1. Be "free-flowing," i.e., "existing or flowing in natural condition without impoundment, diversion, straightening, riprapping, or other modification of the waterway. The existence, however, or low dams, diversion works, and other minor structures at the time any river is proposed for inclusion in the national wild and scenic rivers system shall not automatically bar its consideration for such inclusion: *Provided*, That this shall not be construed to authorize, intend, or encourage future construction of such structures within components of national wild and scenic rivers system." (16 U.S.C. Sec. 1286)

2. Possess "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values." (16 U.S.C. Sec. 1271)

Eligible river segments are classified according to the extent of evidence of man's activity as one of the following:

1. "Wild river areas—Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America."

2. "Scenic river areas—Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads."

3. "Recreational river areas—Those rivers or sections of rivers that are readily accessible by road or railroad that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past." (16 U.S.C. Sec. 1273(b))

Any action which could alter the river segment's ability to meet the above eligibility and classification criteria should be considered an adverse impact. Actions which diminish the free-flowing characteristics or outstandingly remarkable values of a river segment could prevent the segment from qualifying for inclusion in the national system. Actions which increase the degree of evidence of man's activity, i.e., level of development, could change the classification of the river segment.

The effect of all proposed developments within the river corridor should be assessed in terms of severity of effect and extent of area affected. Development outside the corridor which would cause visual, noise, or air quality impacts on the river corridor should also be examined.

Only proposed new construction or proposed expansion of existing developments need be considered in assessing impacts. Repair or rehabilitation of existing structures would not have a negative impact except if the action would result in significant expansion of the facility or if the construction process itself would cause an irreversible impact on the environment.

Placement of navigation aids such as buoys and channel markers will not be considered as causing adverse effects.

The following are examples of types of developments which would generally require consultation with HCRS because of the potential for adverse effects on the values of a potential wild, scenic, or recreational river. The list is not exhaustive.

Small dock	Road
Small bulkhead	Railroad
Clearing and snagging	Building (any type)
Drainage canal, culvert or outfall	Pipeline, transmission line
Irrigation canal	Bridge or ford
Levee or dike	Gas, oil or water well
Rip-rap, bank stabilization or erosion control structure	Sub-surface mine opening
Small reservoir	Quarry
Increase in commercial navigation	Power substation
Dredging or filling	Recreation area
Run-of-the-river dam or diversion structure	Dump or junkyard
	Change in flow regime
	Clear-cut timber harvest
	Radio tower, windmill

The following are examples of types of development which appear most likely to cause serious adverse effects if they are constructed adjacent to or in close proximity to an inventory river. Such development proposals will almost always require consultation with HCRS because their effects are likely to conflict with the values of a potential wild, scenic or recreational river. These effects could be severe enough to foreclose designation of the affected river segment. This list is not exhaustive.

Impoundment	Major highway
Channelization	Railroad yard
Instream or surface mining	Power plant
	Sewage treatment plant
Lock and dam	Housing development
Airport	Shopping center
Landfill	Industrial park
Factory	Marina
Gas or oil field	Commercial dock

Appendix II

[For a memorandum from the President on Wild and Scenic Rivers and National Trails dated August 2, 1979, see the *Weekly Compilation of Presidential Documents* (Vol. 15, page 1279).]

[FR Doc. 80-27823 Filed 9-5-80; 8:45 am]

BILLING CODE 3125-01-M

DEPARTMENT OF DEFENSE

Defense Science Board Task Force on ECM; Advisory Committee Meeting

The Defense Science Board Task Force on ECM will meet in closed session October 2–3, 1980 at the Pentagon, Washington, D.C.

STATE NORTH DAKOTA

River	Physiog. Section	Other States	Counties	Congress. District	Segment Reach Description	Length	Outstandingly Remarkable Values								Narrative Description of Values
							Scenic	Recreational	Geolog.	Fish	Wildl.	Hist.	Cult.	Other	
Little Missouri	13b		Dunn Slope McKenzie Golden Valley Billings	At Large	Lake Sakakawea to Marmarth, North Dakota	255	X	X	X	X		X	X		Badlands topography provides unique scenic values, highly important for recreation; passes through 2 units of Theodore Roosevelt National Memorial Park important habitat for channel catfish reproduction; important paleontological discoveries.

South Dakota
Department of Game, Fish and Parks

Division of Wildlife
Sigurd Anderson Building
445 East Capitol
Pierre, South Dakota 57501-3185
(605) 773-3381

August 30, 1985

Forest Plan Comment Letter #610

Mr. David A. Fillus
Forest Supervisor
Custer National Forest
Box 2556
Billings, MT 59103

Dear Mr. Fillus:

Thank you for the opportunity to comment on the Draft Management Plan for Custer National Forest and National Grasslands.

The South Dakota Natural Heritage Program is a joint project of The Nature Conservancy and the South Dakota Department of Game, Fish and Parks. It is one of about 40 similar programs throughout the United States and Latin America that utilize standardized procedures for compiling and reporting information on rare species and natural communities, ie. exemplary vegetation and wetland types, streams, lakes, etc. These species and natural communities are termed "elements" of natural diversity and represent those biological entities most in need of conservation.

Over the past three years the SD Natural Heritage Program has consulted a wide spectrum of sources for information on the elements of South Dakota's natural diversity. Sources include museum and herbarium collections, scientific publications, unpublished reports, state and federal agency personnel, and expert biologists throughout the Great Plains. The data obtained from these sources are cross-referenced in manual, map and computerized files that provide an easily accessible central repository for information on rare species and natural communities in South Dakota.

A preliminary search of our data base indicates that several elements monitored by the SD Natural Heritage Program occur within the Sioux and Grand River Districts of Custer National Forest. The specific Forest Service lands referred to are Slim Buttes, North and South Cave Hills, East and West Short Pine Hills and Grand River National Grassland. Our comments apply to these lands and address those sections of the Draft Management Plan dealing with threatened and endangered species, sensitive and unique species, research natural areas, and special interest areas. We have also included a brief section on the management areas you have proposed.

THREATENED AND ENDANGERED SPECIES

The list of elements monitored by the Heritage Program includes all species listed as threatened or endangered by the state or federal government for South Dakota. The threatened or endangered species which presently occur or

A

610 p 2

have at one time been documented on Custer National Forest within South Dakota are listed in Attachments A and B.

In both the Draft Plan (Appendix VII p. 1) and in the Draft EIS (p. III-30) two plants are listed as "proposed for Federal listing". Neither the Prairie Fringed Orchid (Platanthera leucophaea) nor Adder's Tongue Fern (Ophioglossum vulgatum) have yet been proposed for Federal listing. However, Platanthera leucophaea is a Federal candidate (C2) species, ie. a taxon currently under review by the US Fish and Wildlife Service. Attachments A and B list several other candidate species that have been documented on the South Dakota portions of Custer National Forest.

The Draft Management Plan adequately addresses the needs of Federally listed threatened or endangered species in South Dakota. However, Federal candidate species should also be listed in the Plan.

SENSITIVE SPECIES, UNIQUE PLANTS AND ANIMALS

We suggest that species monitored by the Heritage Program (listed in Attachments A and B) and assigned the Heritage Status of A or B, be included in the section involving Sensitive Species (Appendix VII p. 5). These species have been determined to be critically rare or rare (Attachment C) in South Dakota. Heritage ranked A and B species meet your definition of Sensitive Species (Glossary p. 36) and should be addressed in your Management Plan.

We also suggest that those species listed in Attachments A and B having the Heritage Status of C or U be considered as Unique Species. Although no definition is given in your plan for Unique Species, we monitor and consider these species to be potentially rare or unique for South Dakota. Habitat for both groups of species is recognized in the criteria used to select Research Natural Areas or Special Interest areas (see next section). Although we have no site specific suggestions at this time, we urge continued cooperation and are willing to assist you with Management guidelines or in the identification of habitat for sensitive and unique species.

RESEARCH NATURAL AREAS AND SPECIAL INTEREST AREAS

The Draft Management Plan lists two established Research Natural Areas (RNAs), two proposed RNAs and six candidate RNAs (p. III-39 and elsewhere). No Special Interest Areas (SIAs) are listed. The designation of SIAs is authorized by the Code of Federal Regulations (36 CFR 294.1) and by the Forest Service Manual (FSM 2360.2 & FSM 2362). The SIA designation is used to recognize areas that do not meet all the criteria of an RNA yet still possess natural features of special interest.

While only one candidate RNA, Deer Reservoir, is listed for the South Dakota portion of Custer National Forest, it is likely that additional RNAs will be needed to provide representive examples of the wide variety of habitats found within the National Forest and Grasslands. For example, 26 habitat types were just recently documented in the Sioux, Grand River and Ashland Districts of Custer National Forest (Hansen, 1985). Twenty-four of these habitat types are not mentioned in the list of 25 "ecosystems" assigned to Custer National Forest for inclusion in RNAs (Draft Plan, Table II-2).

A

B

C

A Your comments concerning the correct status of Ophioglossum vulgatum and Platanthera leucophaea are noted and the corrections have been made in the Final EIS and Forest Plan. We have retained the latter as a T&E plant species with a note as to its current status.

The Forest will coordinate with the States of North and South Dakota in initiating a Rare Plant and Animal Species Inventory. This inventory will also define criteria to differeniate between such terms as rare, sensitive, and unique. The Forest Direction (Chapter II, Forest Plan) and Appendix VII have been expanded to include the plant and animal species identified by both North and South Dakota. As previously stated, the Forest will coordinate with both States on developing the cirteria for sensitive, rare, and unique species. This criteria will serve as the guideline for adding to or deleting species from this initial inventory in Appendix VII. The plant and animal species listed in Attachments A and B have been added to Appendix VII, Forest Plan.

The management direction contained in Chapter II (Unique Plants and Animals) provides for the retention of habitats for these species.

B Portions of the Sioux Ranger District does support a high density of nesting raptors which provides unique wildlife habitat. For this reason, the Forest believes that management objectives of this area is better served by keeping this area as part of Management Area C (wildlife emphasis). Reference Chapter III, Forest Plan, Management Area C.

C The Forest objective is to identify and recommend RNA classification for representative samples of habitat types which occur on the Forest and that have been assigned through the Northern Regional Guide (Chapter II, Forest Plan). Not all habitat types occurring on the Forest will be represented in the Forest RNA system. If unique or special areas in South Dakota are identified as possible candidate areas, Forest Direction provides for the establishment of these candidate areas as RNA (Chapter II, Forest Direction).

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Special interest Areas should also be identified and established within Custer National Forest. For example, the Background Reports for the Sioux Ranger Planning Unit (Richmond et al. 1976) report that certain areas of the Slim Buttes, North Cave Hills and South Cave Hills support some of the highest densities of nesting raptors in North America. While the Draft Management Plan provides some protection for raptors from construction activity (Ch.II, p. 27) areas of such biological significance as these deserve formal recognition and management. B

Sections of the Draft Management Plan dealing with Research Natural Areas should include a statement acknowledging the fact that as additional habitat types and areas of special interest are identified, appropriate RNAs and SIAs will be evaluated and proposed. Such a statement would compliment the section on "Additional Data Requirements..." (Ch. II,p. 10) where deadlines are established or are ongoing for obtaining information on threatened and endangered species, indicator species, habitat types, etc. The SD Natural Heritage Program would be willing to assist the Forest Service in the evaluation and the production of establishment reports for Deer Reservoir and other suitable RNAs and SIAs. It is our understanding that designating additional RNAs and SIAs would not constitute a major change in the Management Plan and could be accomplished as part of the five year revision. D

MANAGEMENT AREAS

We suggest Management Area E for North Cave Hills, B for South Cave Hills and B for the majority of Slim Buttes be re-evaluated. Perhaps these Management Areas could be better compartmentalized to provide adequate populations of raptor prey species and provide for security from disturbance. The guidelines for "Eagles", "Falcons" and "Merlins" in Chapter II (p. 28) prevent direct disturbance but do not account for the indirect impacts associated with intensive grazing or mining on these sensitive areas. Although attempting to manage raptors, cattle and mineral development will be difficult, the high diversity and densities of nesting raptors suggested by Richmond (et al. 1976) are worthy of preserving and should be better addressed in your management plan. Sites known to contain nesting raptors need to be identified and protected by special management designations which will guarantee adequate prey species, freedom from disturbance and esthetic appeal. In conjunction with previous sections of our review, we encourage cooperation with The Heritage Program and suggest our involvement in the identification and selection of RNAs and SIAs. E

REFERENCES

Hansen, P.L. 1985. An ecological study of the vegetation of the Grand River/Cedar River, Sioux and Ashland Districts of the Custer National Forest. Ph.D. Thesis, South Dakota State University, Brookings, SD 250p.

Houtcooper, W.C., D.J. Ode, J.A. Pearson, and G.M. Vandel III. 1985. Rare animals and plants of South Dakota. The Prairie Naturalist, 17 (IN PRESS).

D Agree. A statement has been added to acknowledge that as additonal habitat types are identified, appropriate RNA's will be evaluated (Reference Table II-3, Chapter II, Forest Plan).

E The Forest Plan is somewhat misleading as to the management area designation for the rimrock ecosystem and associated habitat types. The entire rimrock ecosystem of the Sioux Ranger District, which is the vital habitat for raptors, is included in Management Area C. The goal of this management area is to manage these key habitats for the optimum quality and diversity for the various wildlife species (Reference Chapter III, Forest Plan, Management Area C).

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Richmond, R.M., Team Leader. 1976a. Final environmental statement, Sioux Planning Unit, Custer National Forest. U.S.D.A. Forest Service, Billings, MT. 129p.

Richmond, R.M., Team Leader. 1976b. Background reports for the Sioux Planning Unit. U.S.D.A. Forest Service, Custer National Forest, Dickenson, ND, 215p.

Sincerely,

Dave Ode
Botanist/Plant Ecologist

George Vandel
Resource Staff Specialist

DO/GV/rh

SOUTH DAKOTA ELEMENTS DOCUMENTED FOR SLIM BUTTES, CAVE HILLS, SHORT PINE HILLS AND VICINITY

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Scientific Name Common Name	Official Designation	Heritage Status	Comments
Accipter gentilis Northern Goshawk		C(d)	Breeding restricted to the Black Hills and Harding County.
Ammodramus bairdii Baird's Sparrow		B	Restricted to native prairie in n-central and nw SD.
Aquila chrysaetos Golden Eagle		C	Summer and possibly winter resident of w SD.
Aster pauciflorus Marsh Alkali Aster		U	Collected from the South Cave Hills 9 Jul. 1959. The most recent collection in SD.
Buteo regalis Ferruginous Hawk	CL	C	Restricted to prairie grasslands, gradual habitat declines.
Buteo swainsoni Swainson's Hawk	CL	C	Common summer resident of prairie grasslands and cropland edges.
Calcarius mccownii McCown's Longspur		U	Formerly common, now rare, if present, they would be in extreme nw Harding County.
Chaenactis douglasii Douglas Dusty Maiden		U	Collected from Slim Buttes and Short Pine Hills. Most recently in 1941.
Falco columbarius Merlin		B	Rare breeder in Black Hills and Harding County.
Falco mexicanus Prairie Falcon		A	Formerly abundant now restricted to isolated areas of w SD.
Falco peregrinus Peregrine Falcon	FE,SE	A	Likely a former resident of Harding County, may migrate or winter in area.
Gentiana affinis Rocky Mtn. Pleated Gentian		B(p)	Reported as "abundant along brooks in the Cave Hills" in 1910.

SOUTH DAKOTA ELEMENTS DOCUMENTED FOR SLIM BUTTES, CAVE HILLS, SHORT PINE HILLS AND VICINITY

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Scientific Name Common Name	Official Designation	Heritage Status	Comments
Haliaectus leucocephalus Bald Eagle	FE,SE	A	May winter in Harding County, occasional summer records, definite migrant.
Haplopappus armerioides Skyline Goldenweed		U	Collected from the Cave Hills 8 Jul. 1920. Most recent collection in SD is 1948.
Lagurus curtatus Sagebrush Vole		B(p)	Occurs in nw SD, probably only in Harding County, rare state species.
Lasionycteris noctivagens Silver-haired Bat		C	May use caves of Harding County and Black Hills, statewide migrant.
Myotis evotis Long-eared Myotis		A(p)	Very few records, has been documented in Harding County.
Phalaenoptilus nuttallii Poor-will		B	Utilizes rock outcrops and woody draws of w SD including Harding County.
Phrynosoma douglassi Eastern Short-horned Lizard		B	Scattered few occurrences in w SD including Harding County.
Plecotus townsendii Townsend's Big-eared Bat		B	Sensitive to disturbance, few records but documented in Harding County.
Sialia sialis Eastern Bluebird		B	Western-most records for SD are in Harding County.
Spizella breweri Brewer's Sparrow		C	Restricted to sagebrush communities in nw and sw SD.
Vulpes velox Swift Fox	CL,ST	A	No recent den site records for Harding County but sightings continue.

SOUTH DAKOTA ELEMENTS DOCUMENTED FOR THE GRAND RIVER NATIONAL GRASSLANDS AND VICINITY

610 17

Scientific Name Common Name	Official Designation	Heritage Status	Comments
Ammodramus bairdii Baird's Sparrow		B	Some of the highest densities for this species may be in Perkins County.
Buteo regalis Ferruginous Hawk	CL	C	Restricted to prairie grasslands, gradual habitat declines.
Buteo swainsoni Swainson's Hawk	CL	C	Common summer resident of prairie grasslands and cropland edges.
Eriogonum visheri Visher's Buckwheat	CL*	B(e)	Restricted to certain geologic outcrops in badlands of central SD & s-central ND.
Falco peregrinus Peregrin Falcon	FE,SE	A	Probably only a migrant in Perkins County but nesting habitat is available.
Grus americana Whooping Crane	FE,SE	A	Several migration sightings for Perkins County.
Haliaectus leucocephalus Bald Eagle	FE,SE	A	Probably only a migrant but is sighted occasionally during the summer.
Mustela nigripes Black-footed Ferret	FE,SE	A	No recent documented locations are known for Perkins County.
Phrynosome douglassi Eastern Short-horned Lizard		B	Few scattered w SD records including Perkins County.
Spizella breweri Brewer's Sparrow		C	Restricted to sagebrush communities of nw and sw SD.
Vulpes velox Swift Fox	CL,ST	A	No recent den sites are known but several sightings are from Perkins County.

* E. visheri will appear in the forthcoming Federal Register of Plant Taxa Under Review as a category 2 species (John Fay, OES, pers.comm. 1985).

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ELEMENT STATUS CODES

OFFICIAL DESIGNATION

FE: Federal Endangered
FT: Federal Threatened
PE: Proposed Federal Endangered
PT: Proposed Federal Threatened
CL: Candidate for Federal Listing
SE: State Endangered
ST: State Threatened

HERITAGE STATUS

Major Categories

A: Critically Rare- in danger of extirpation in the state; very rare or habitat seriously threatened.

B: Rare- known from few sites in the state; species, community, or habitat considered vulnerable or declining.

C: Uncommon- apparently secure in the state at present but warrants monitoring; may be localized or declining.

U: Status Undetermined- possibly rare, declining or extirpated in the state; more information is needed on present abundance and threats in order to determine status.

H: Historical Records Only- not reported in the state for more than 50 years but habitat may still exist and rediscovery is possible.

X: Presumed Extirpated- no longer believed to occur in the state; populations or habitat have greatly declined and no recent occurrences are known; rediscovery is unlikely.

Descriptive Categories

(p): peripheral- occurrences in South Dakota represent the edge of the natural range.

(d): disjunct- occurrences in South Dakota represent a separation from the primary contiguous population or a discontinuous distribution.

(e): endemic- occurrences in South Dakota represent all or a significant portion of the range in the state or in the Northern Great Plains region.

NORTH DAKOTA PARKS AND RECREATION DEPARTMENT

Pinehurst Office Park
1424 West Century Avenue
Suite 202
Bismarck, ND 58501
Phone: (701) 224-4887

August 30, 1985

Forest Plan Comment Letter #622

David A. Filius, Forest Supervisor
Custer National Forest
Box 2556
Billings, MT 59103

Dear Mr. Filius:

This is to inform you we will comment on the draft Custer National Forest and National Grasslands Land and Resource Management Plan. Our department will address three aspects of the plan:

1. Research Natural Areas and Special Interest Areas especially as they apply to the North Dakota Nature Preserves Act,

2. Fulfillment of state outdoor recreation needs by the Forest Service,

3. Existing and proposed state parks adjacent to Forest Service land and the implications in their presence there.

Comments general in nature and detailed comments on specific management areas will be sent to your office under separate cover by September 16, 1985.

We feel the Forest Service Plan has major implications for the state of North Dakota. It is our department's responsibility to ensure the needs of the North Dakota populace are met in the three areas mentioned.

Our comments are based on data and plans compiled by our Department to facilitate recreation and natural area planning. These are the State Comprehensive Outdoor Recreation Plan, Natural Heritage Inventory, State Parks System Plan, Centennial Parks Plan, and Garrison Diversion Unit Recreation Plan. We will send these plans under separate cover.

In addition, we refer to two pieces of North Dakota legislation in our comments, The Nature Preserves Act (NDCC 55-11) and the All-Terrain Vehicle Act (NDCC 39-30). These are available from us or the Legislative Council if you would like copies.

The Natural Heritage Inventory is now a cooperative program of the Parks and Recreation Department and the Game and Fish Department. Much information collected by the Inventory has been incorporated into the Game and Fish comments, especially concerning rare species, Research Natural Areas and Special Interest Areas. We concur with and fully support their comments in these areas and will have additional comments on RNA's and SIA's.

The comments of the North Dakota Parks and Recreation Department were included in the letter received under the addressee of the North Dakota State Department of Fish, Wildlife, and Parks. The responses to their comments are included in the response to that letter.

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We are very pleased to submit comments on the draft plan and would like to continue to work with the Forest Service to provide our information and expertise in recreation and natural areas planning and program implementation. In offering our help, the Forest Service will benefit by receiving additional data and insights, and the Parks and Recreation Department can ensure that these public lands fit the needs of the state.

Thank you for the opportunity to comment.

Sincerely,

Doug Elken

Doug Elken
Director

PJD/siv

South Dakota
Department of Game, Fish and Parks

Division of Wildlife

3305 West South St.
Rapid City, SD 57702

July 23, 1985

Forest Plan Comment Letter #624

David Filius
Forest Supervisor
Custer National Forest
P.O. Box 2556
Billings, MT 59103

Dear Dave:

The South Dakota Department of Game, Fish and Parks, Wildlife Division has reviewed the Draft Custer National Forest and Grasslands Land and Resource Management Plan and accompanying documents. We have had earlier input and were in attendance at the May 23, 1985 meeting held for state government for briefing of the Plan.

We appreciate the opportunity to participate in the planning process. Most of our comments listed will reiterate those earlier expressed.

Range - We can support your goal to maintain approximately the current level of AUM's on the Forest (Chap.II, p. 1) and to improve range condition. On page 7 of the Overview Plan, you state 56 percent of the range is rated as in good to excellent condition, 39 in fair, and 5 percent in poor or very poor condition. We concur there is need for range improvement.

However, we have serious reservations on how you plan to accomplish the above and still continue to maintain or improve wildlife habitat conditions (goal 6, Chap. II, p. 1). On page 7, the Overview states that the proposed Alternative will improve wildlife habitats on key areas. However, many times these areas make up a very insignificant portion of Forest Service administered lands, e.g., of the 155,370 acres on the Grand River National Grasslands only 874 acres (<1.0%) have been designated wildlife emphasis. A

For land management to be of significance to wildlife it must be accomplished on a large scale basis primarily through grazing management. Structural developments and grazing strategies are being proposed to increase carrying capacity by improving livestock distribution and subsequently range condition. Unfortunately, grazing systems often implemented (e.g. deferred) are not as beneficial to wildlife as the present season-long system employed. Rest-rotation is sometimes used but impacts upon woody species have not been real favorable. Increased stocking often negates benefits to wildlife. Careful planning and potential impacts on all resources should carefully be weighed prior to changes in grazing management. The range resource should be the number one consideration. We recommend no increase in AUM's until the range B

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A The level of livestock grazing has been revised in the Final Forest Plan. Instead of a slight increase in stocking over time, the Final Forest Plan projects stocking level to be at or near current permitted numbers. In conjuction with this, intensive range management systems will be implemented. Some allotments, especially those in key wildlife areas, may have to undergo a reduction in stocking.

B We agree that the range resource must be the number one consideration. Intensive grazing management strategies will be implemented on most allotments to provide for the grazing of domestic livestock at a level that provide for management of the basic resources of soil and water. The different needs of wildlife will also be considered. We do not believe that season-long grazing provides the best means to accomplish these objectives. Grazing systems such as rest-rotation or deferred-rotation, when properly implemented, can provide increased carrying capacity that can be allocated to wildlife or livestock, while at the same time improve watershed conditions.

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condition is good to excellent. This will help expedite the process. It is especially important to be somewhat conservative in view of the given drought conditions. B

Riparian-Woody Draw - Our Division supports your goal for managing riparian areas and woody draws from conflicting uses (Chap. II, p. 1). The goal states that most disturbance type activities are restricted in these areas. It has been our experience and from research findings that livestock use - grazing, rubbing and trampling is the single most factor impacting these critical areas. How does the Plan propose to manage grazing in these sites?

We have observed light to medium grazing under continuous systems to allow growth of dispersed woody cover. Some survival is attained with deferred and rest-rotation under certain circumstances. But generally speaking, individual riparian pastures and/or special management emphasis are required to sustain woody species. C

Mineral Resources - Preliminary wildlife surveys in conjunction with proposed mineral development must be done in a timely and efficient manner. This requires close interagency coordination. Sufficient lead time must be allowed to properly carry out prescribed reconnaissance. D

Transportation Planning - As our Division has expressed in the past, we are very much interested in road construction that is required for resource management. We would be glad to work with the Districts on a local basis. E

Our Division appreciates the opportunity to submit comments. We continue to look forward to working with the Forest Service in all phases of land management.

Sincerely,

Arthur Carter
Wildlife Biologist

AC/i
cc: Dana Nelson

C The management of woody draws and riparian areas continues to present a challenge to the Forest. Livestock use in these areas can be very demanding on the resources, and the ecology of these areas—especially woody draws—is not completely understood. Improving the range condition of these areas does not appear to be as simple as reducing or terminating grazing altogether. The current literature suggests that:

> "Vegetation in meadows and drainageways is closely utilized (by livestock) under any stocking rate or system of grazing. Reducing the livestock or adjesting grazing seasons usually will not solve the problem". (Amour, C.L. 1977. Effects or deteriorated range str4eams on trout. Quote from A. Hormay, personal communication).

Recent research from the Rocky Mountain Forest Research Laboratory, Rapid City, South Dakota found that protection from cattle browsing made an important difference in development of sprout clumps (of woody species) but did not affect number of sprouts surviving after three years. Heavily browsed sprout clumps may or may not die. (Bjugstad, A.J. and M. Girard. 1985. Wooded Draws in Rangeland of the Northern Great Plains).

The Forest Plan provides for management practices such as fencing, more intensive grazing systems, water developments, and possibly shade sheltes to discourage use of these important areas by cattle. Monitoring of these special habitats is identified in Monitoring Items C4 and F4 (Chapter IV, Forest Plan).

In areas where there is damage to the riparian zone from livestock grazing, the intent is to address this situation through management practices that include adjusting season of use, movement of watering facilities etc.

D We agree. No response is necessary.

E No response is necessary.

September 1.1985

Mr. David A. Filius, Forest Supervisor
Custer National Forest
P.O. Box 2556
Billings, MT 59103

Forest Plan Comment Letter # 693

Mr. Filius;

As a member of the Low Hat Clan, I would like to take this opportunity to thank you for allowing a public comment period.

I was appointed as spokesman for the Low Hat Clan this past winter. In this capacity I would like to express my concern and respect for the Management area K, the area known as the Blue Buttes Area. As you are aware, this area is the birthplace of the Low Hat Clan and is still used and considered as a Religious site for not only the Low Hat Clan members, but is a Fasting site for other members of the Three Affiliated Tribes. The respect for the land, and for sacred sites such as the Blue Buttes area, is still very evident among the Mandan-Hidatsa and Arikara and they are still much used by the young and old alike.

With this, I like to state that we are in agreement with the statements in the plan. The actual butte that the Clan was started is in Section 3 R94W T151W. If this in any way can be taken into consideration as part of the Management Plan and can be protected as the rest of the Blue Buttes is this would be much appreciated and needed. The area as a whole is equal in importance.

The Low Hat Clan wishes to thank the USFS for the past help and information, and also we will plan on keeping this avenue of communication open.

Sincerely,
Gerard Baker
Gerard A. Baker

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A I appreciate your support for our Proposed Action. If I am correct, the butte to which you refer in Section 3, T151W R94W is Table Butte. Since this areas is in private ownership, the Forest Service has no control over the management. Hence, it would be of no use to include it in Management Area K.

State of Montana
Office of the Governor
Helena, Montana 59620

TED SCHWINDEN
GOVERNOR

September 3, 1985

Forest
Plan
Comment
Letter
523

Mr. David Filius, Supervisor
Custer National Forest
2602 First Avenue North
P. O. Box 2556
Billings, Montana 59103

Dear Mr. Filius:

The State of Montana appreciates this opportunity to review and comment on the Draft Custer National Forest Plan (Plan) and Environmental Impact Statement (EIS). Your agency's presentation of the Plan to Montana's Interagency Planning Task Force and Ad Hoc Committee on Forest Resources was also appreciated. The attached comments reflect the task force review and concerns regarding the Plan.

The Custer National Forest (CNF) is to be commended for producing a Plan and DEIS that are well written and organized.

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The state supports planning efforts on the CNF to assure that a sufficient amount of timber is offered to maintain a competitive forest products industry without jeopardizing other important forest resources. We are concerned, however, that while the preferred Plan proposes to offer a significantly greater amount of timber for harvest (4 MMBF) than historic amounts (1.5 MMBF), it does so without providing the reader sufficient explanation of why the proposed increase is necessary. Therefore, it is difficult to determine whether the proposed harvest level of the CNF is appropriate. A

We look forward to your consideration and response to the attached comments in the Final Plan and EIS.

Sincerely,

TED SCHWINDEN
Governor

Attachment

A Maintenance of a competitive forest products industry is only a small part of the rationale for the proposed increase in the annual timber harvest levels in the Forest Plan. Analysis of public comments concerning the timber harvest level proposed in the Draft EIS resulted in a lowering of the proposed harvest level from 4.0 mmbf to 3.0 mmbf annually. While this level is substaintially higher than historic levels, the Forest believes that it represents a level necessary for the maintenance and improvement of timber stand conditions, increase stand productivity, and improve wildlife habitat. This revised level of timber harvest will maintain historic harvest levels on the Beartooth District (.5 mmbf/year), the Sioux District (1.0 mmbf/year), while initiating a modest harvest level on the Ashland District (1.5 mmbf/year). In the recent past, little or no timber has been harvest on the Ashland District due to the economic situation of the Ashland mill. In essence, the Final Forest Plan proposes a maintenance of the status quo for timber harvest except for the Ashland District. If the mill at Ashland remains defunct, or another source of demand cannot be found for this timber, the Forest timber sale program would essentially remain at historic levels (1.5 mmbf). In other words, the volume forgone from the Ashland District would not be made up from the other Districts on the Forest.

K 23p2

State of Montana
Office of the Governor
Helena, Montana 59620

TED SCHWINDEN
GOVERNOR

MONTANA COMMENTS ON THE 1985 DRAFT CUSTER NATIONAL FOREST PLAN AND ENVIRONMENTAL IMPACT STATEMENT

Overview.

In general, we found the Custer National Forest Plan (Plan) and Draft Environmental Impact Statement (DEIS) to be well written and organized. The inclusion of a specific description of data requirements, including a time frame for obtaining the data (Table II-3, Plan) was appreciated. Also, the specific forest standards beginning on page II-8, (Plan) provided an understandable description of the management proposed for the Custer National Forest (CNF).

It was unfortunate, however, that errors in the DEIS required the issuance of an entirely new Table II-18. Because of this, we were never totally sure whether the analysis presented in the text was based on correct information. This was especially evident in regard to timber harvest levels and associated activities. It was not clear whether the tables for activities such as acres harvested and acres harvested by harvest method were correct. B

The research needs identified in the plan address some important and timely problems, especially in the areas of noxious weed control and range productivity. Regarding water quality and watershed protection, however, the Plan and DEIS continued to follow the deficient pattern to inadequate monitoring, data collection and modeling efforts we have seen in other current forest planning efforts in Region 1. As a result, little information is available in the documents to support water quality/quantity evaluations. C

In addition, the following concerns were identified:

- o One of the Plan's goals for timber management is "...to maintain the approximate current levels of employment in timber dependent communities." The Plan, however, does not explain why the large increase in proposed harvest (4 MMBF) over the historic harvest levels (1.5 MMBF) is considered necessary to meet that goal in the future. D
- o The Plan's assumption that the real price of stumpage will increase through the planning period is questionable. E
- o Trails are essential to maintaining and increasing non-vehicular dispersed recreation on the CNF, yet trails are not discussed in the alternatives or dispersed recreation sections of the DEIS. F
- o Significantly increased timber harvest-related activities proposed in the Pryor Mountains will increase sedimentation problems and aggravate an already serious habitat degradation problem caused largely by past timber harvest and grazing abuse of those watersheds. G

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B We realize that the revised Table II-18 made the review of the Draft EIS and Forest Plan somewhat difficult. Time did not allow for the many corrections that were necessary in the body of the document.

C The entire Soil, Air, and Water section of the Monitoring and Evaluation portion of the Forest Plan has been revised to insure adequate water quality evaluation. In addition, the management direction for the Forest is to meet all State water quality standards, follow BMP's and develop a water quality monitoring plan that will detect changes in sediment yield.

D See response to Comment A above.

E The assumption that the real price of timber will increase over time is based on direction from the Northern Regional Office. Long-term trends in supply and demand were used in developing the rate of increase.

F Almost all of the trails on the Custer National Forest are located on the Beartooth Ranger District and are assoicated with access to and within the Absaroka-Beartooth Wilderness. Although trails are not specifically mentioned in the Alternative Description/Comparison section of the Draft EIS, those alternatives that emphasize recreation and other non-comodity values would place a greater emphasis on trail management. The Proposed Forest Plan outlines the Trail Management philosophy for the proposed action in Chapter II, Forest Direction. The Proposed Forest Plan calls for the construction of the North Country National Scenic Trail and allows for the construction of additional trails if necessary to meet the intent of the different management areas. The Forest does not expect any loss of existing trails due to road construction. The budget proposed under the Proposed Plans allows for the maintenance of the existing Forest Trail system.

G The Final Forest Plan does not significantly increase the timber harvest and related activities in the Pryor Mountains. The regulated harvest level for the Beartooth District will be approximately .5 mmbf, some of which will come from other areas on the District.

K23P3

- o We challenge the assumption used in the Plan that significantly increased timber harvest levels proposed will likewise significantly benefit wildlife on the CNF. H

- o In 1982-83, nearly 50,000 fisherman days were expended in the Stillwater drainage. The Plan, however, does not mention water quality monitoring for this important drainage, and emphasis is placed on rehabilitation, rather than protection. I

- o The CNF valued grazing at higher theoretical market values rather than actual grazing fees, while timber was valued at expected revenues. The effect is the relative overstatement of grazing values to timber values. J

These and other concerns are addressed in more detail in the following discussion.

1. Timber.

The CNF Plan has recommended a timber harvest level of 4 MMBF per year through 2035. This figure is substantially greater than has occurred in the past five years, when the average harvest has been 1.5 MMBF. The largest harvest in recent years was in 1972 when 4.7 MMBF were cut. K

One of the state's concerns regarding the timber resource on the CNF is that the components of local and state economies which depend on the availability of commercial timber from the CNF are adequately considered in the proposed Plan. Factors important in evaluating adequacy are the projected national, international and local demand for timber products; the capacity of mills served by the CNF to produce timber products; and the historical, current and proposed timber harvest levels.

Unlike many of the other forest plans, the CNF Plan does provide some limited information on the needs of mills in the "Forest's zone of influence." Because of the dispersed nature of forest districts in the CNF and the isolated locations for timber, mill dependency tends to be on districts, or a portion of districts, rather than the entire CNF. Mills served in the CNF zone of influence have a capacity of 6 MMBF. The Ashland Division on the CNF has a capacity of about 4 MMBF. The Plan points out that the Ashland Mill has not been a reliable source of demand for some time because of frequently changing ownership of the facility. Also, alternative timber is available in the Ashland area, such as that owned by the Northern Cheyenne and Crow Indian Tribes.

As a result of these factors, apparently planned sales in the CNF are more than adequate to provide mills with timber. This conclusion, however, is based upon mill capacity rather than an examination of timber demand. The information that is likely to result from research in progress by the Forest Service Regional Office in Missoula on mill capacity and national forest dependence, and the Forest Service/Montana Department of State Lands analysis of overall demand, may further qualify the nature of timber needs on the CNF. Finalization of the CNF Plan should include the pertinent information from these studies.

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H The basic assumptions concerning timber harvest varied by area. In areas where cover was considered as limiting, such as the Sioux District, timber harvest was considered as impacting to wildlife habitats in the short run. As the stands regenerate and cover returns the extent of the impact diminished. In areas where cover was not considered as limiting, such as the lodgepole pine stands on the Red Lodge Ranger District that are above the winter rang, and below the summer range, timber harvest was considered as beneficial. Constraints were placed upon the amount of timber harvested to preclude large portions of areas being harvested at any one time.

I Other than recreation, there are very few surface disturbing activities planned in the important Stillwater drainage. We recognize that the anticipated Stillwater Mine could pose a threat to water quality. However, the Stillwater Mine EIS requires extensive water quality monitoring. This monitoring in addition to Forest Service monitoring in the Upper Stillwater to track effluents from the McLaren Mine have been added to the Monitoring and Evaluation Plan. Reference Monitoring and Evaluation Item F3, Monitoring Evaluation Plan, Chapter IV, Forest Plan.

J The values used for timber and range forage represent comparable values. These values displayed in the EIS are "willingness to pay" values developed for the 1980 RPA Assessment. They are based on research conducted throughout the country and represent what the public is willing to pay for an AUM or board foot of timber. In essence, the values used in FORPLAN represent "in sito" values of the resource. The values vary somewhat depending upon the location, but these values were used consistently throughout the Northern Region.

K The present timber management plan for the Forest calls for a timber harvest program of 10.4 mmbf per year. This level of harvest has never been funded nor has there been the demand for the level of harvest. The demand for timber has been influenced by many factors in the past as it probable will be in the future. The recommended harvest level of 3.0 mmbf for the next decade is adequate to supply small local mills at this time. As other mills within reasonable log hauling distance such as those in South Dakota compete for timber from the Custer, competition will drive the price of timber up and some small local mills may not be able to compete. When additional information is available that influences decisions made on the Forest it will be incorporated.

K-23 p4

One of the Plan's goals for timber management is "...to maintain the approximate current levels of employment in timber dependent communities." The Plan should explain why the large increase in proposed harvest (4 MMBF) over the historic harvest levels (1.5 MMBF) is considered necessary to meet that goal in the future. L

The timber productivity classes of the CNF are displayed in Appendix I (page 6). All of the tentatively suitable timber is in the two lowest classes. Normally, the lowest category is not considered for harvest and it is surprising that it is considered here. The 1976 Sioux District Land Management Plan states "The average stand of trees grows 26 cubic feet per acre per year." This is barely above the very lowest productivity class. M

The utilization of small material and slash, as outlined in the timber objectives, is encouraged. Strategies for treatment and prevention of insect and disease problems are excellent and should be continued where feasible. N

The specific standards for timber management areas are very good. The timber base acreage for each alternative should be included in Table II-18 of the DEIS to allow better comparison of the alternatives. Timber management should not be permitted in Research Natural Areas. O

2. Economics.

The decision flow diagram (Chapter IV, page 5) shows that if the current budget is not adequate to produce the quality and quantity of outputs planned, and if the future budget outlook isn't adequate to accomplish the projected outputs, then the CNF will initiate a revision of the Plan. The proposed alternative requires an annual budget of 7.6 MM dollars (in 1978 dollars), while the FY '84 Forest budget was only 6.1 MM dollars. Given the current federal emphasis on budget reduction, the CNF should be prepared for this scenario. P

Page 15, Chapter V of the Plan, states that: "Traditionally, the timber harvest program has not turned a reasonable benefit/cost ratio and the annual allowable harvest as determined by the 1967 Timber Management Plan has not been implemented. Extensive roading is needed to access the resource and the market value of the timber has not been sufficient to support the roading." Further discussion is necessary to explain how this situation has or has not changed, and why an increased harvest is now deemed economically feasible. Q

The assumption on page B-76 that the real price of stumpage is projected to increase through the planning period is questionable. The CNF should conduct a sensitivity analysis to determine how a change in price affects the economic viability of the program. Specifically, a zero increase in real prices should be tested. R

There appears to be a discrepancy in regard to the unit of measure for local forest-related income, returns to the U.S Treasury and returns to the State. Most references are in MM dollars, however, Figures II-19 and II-20 and Table B-6 of the DEIS show M dollars. S

L Maintenance of a competitive forest products industry is only a small part of the rationale for the proposed increase in the annual timber harvest levels in the Forest Plan. Analysis of public comments concerning the timber harvest level proposed in the Draft EIS resulted in a lowering of the proposed harvest level from 4.0 mmbf to 3.0 mmbf annually. While this level is substaintially higher than historic levels, the Forest believes that it represents a level necessary for the maintenance and improvement of timber stand conditions, increase stand productivity, and improve wildlife habitat. This revised level of timber harvest will maintain historic harvest levels on the Beartooth District (.5 mmbf/year), the Sioux District (1.0 mmbf/year), while initiating a modest harvest level on the Ashland District (1.5 mmbf/year). In the recent past, little or no timber has been harvest on the Ashland District due to the economic situation of the Ashland mill. In essence, the Final Forest Plan proposes a maintenance of the status quo for timber harvest except for the Ashland District. If the mill at Ashland remains defunct, or another source of demand cannot be found for this timber, the Forest timber sale program would essentially remain at historic levels (1.5 mmbf). In other words, the volume forgone from the Ashland District would not be made up from the other Districts on the Forest.

M The lowest class of timber productivity (0 to 20 cubic feet per acre per year) is not considered as part of the tentatively suitable timber base. Tim er productivity classes used in the Forest Plan are based on Forest Habitat Types of Montana, Robert D. Pfister, et al, 1977. The habitat tyupes consdiered for timber management in the Forest Plan are types that can be regenerated within the required five years and the growth potential exceeds 20 cubic feet per acre per year.

N No response is necessary.

O This is a good suggestion. This data has been incorporated in Table II-18 in the Final EIS.

P The budget required to implement the Final Forest Plan has been revised downward to $6.7MM in 1978 dollars. Comparatively, fiscal year 1985 budget was $5.6MM or $3.5MM in 1978 dollars. Therefore, we are proposing a doubling of the operating budget. This is, as you point out, incongruent with the continuing emphasis to limit and/or reduce Federal government spending. This is of serious concern to the Forest. Most of the increased cost is to improve the quality of the management of programs such as soil, air, water, wildlife and recreation which have tended to be slighted in favor of production-oriented programs, such as range, timber, and minerals. There are many parts of the plan that we will not be able to implement without adequate funding. Recreation facility maintenance and replacement, timber, range, and direct vegetative and habitat improvements may have to be deferred if budgets are reduced as expected. However, much of the management in the plan is not budget dependent and will be implemented. Low development areas will be established as planned. The new direction for resource management decisions will be used. The plan identifies a combination of management opportunities and the Forest is hopeful that we have convincing analyses to demand adequate Congressional funding.

K-235

3. Recreation.

a. Hunting.

Chapter IV, page 9, states: "A majority of the dispersed recreation in the Forest (with the exception of the Beartooth District) occurs during hunting season." Figure II-17 shows an increase in recreation in all alternatives and a decrease in deer in all alternatives save one. Even acknowledging developed recreation, the above two categories are related, making the recreation increase questionable. The proposed reduction in big game and small game habitat will lead to a reduction in hunting permits, and therefore in hunting recreation on the CNF. T

With the increasing difficulty of access to private land for public recreation in eastern Montana, it is difficult to overemphasize the importance of the CNF as a place the general public can use and enjoy. This demand will undoubtedly increase, possibly dramatically. With significantly increased timber harvest comes not only the potential for less big game habitat, but also a concurrent potential loss in hunting and its associated recreational opportunity. In 1983 people from half the states in this nation hunted in the Long Pines section of the Sioux District. Two of their main reasons were the beauty of the area and the abundance of game. U

b. Alternatives.

With recreation an important use of Montana National Forests, including the CNF, the alternatives developed should reflect a range of recreation investment.

Alternatives should provide a range of investment opportunities in new recreational improvement and programs that would encourage higher recreation use, and enhance the quality of recreational experiences. New recreational improvements should include, for example, campgrounds; picnic areas; parking lots; trailheads; motorized, horse, foot, ski and handicap trails; informational signing, maps and brochures; and educational programs.

Recreation usage can be increased with added recreational improvement and by improving the recreational experience. Anticipated RVDs and associated economic benefit would then vary with each alternative depending on the degree of recreation investment.

This is not currently the case. For developed recreation all alternatives merely keep existing developed sites open with no alternative proposing new facilities (DEIS II-38). No alternatives present investment strategies to increase dispersed recreation use, except incidently - driving for pleasure is expected to increase because of additional investment in roads (for timber and oil and gas development) throughout the CNF (DEIS II-38). V

Since many of Montana's recreationists are from out-of-state, figures for growth of recreation visitor days (RVDs) should be based at least partially, on non-resident visitation projections. W

Q Traditionally, timber harvest on the Custer National Forest has not shown a positive cost/benefit ratio. The Forest does not project that this fact will change in the future. However, that is not to say that the Forest is not concerned about costs. The sole criterion for sale of National Foret timber is not whether the direct receipts will exceed direct costs. The benefits claimed from timber sales include vegetation management for wildlife, increased forest protection, improved access for recreation and other forest uses, and other non-priced benefits. As a result of aggressive fire control and a modest harvest program over the past several decades there is a high ratio of mature and overmature trees over most of the forested lands. An increase in the harvest level is necessary to allow treatment of several thousand acres of timber that are considered highly susceptible to catastrophic fires or insect epidemics. The Forest Plan is the most cost efficient alternative for meeting the multiple use objectives of the Forest.

R The real price increase projected for timber stumage represents the best information from research. Projected prices used in the FORPLAN analysis do not reflect traditional market highs or low. A sensitivity analysis was not conducted. In general direct costs for the timber program on the Forest is not offset by direct revenues. However other benefits to wildlife and access for recreation are non-priced benefits that are attributed to the timber harvest program.

S This error has been corrected in the Final EIS, Appendix B.

T The statement that you quoted (Chap. IV, pg.9) is a misstatement. What is intended to be represented here is the fact that a significant portion of the dispersed recreation component is composed of hunting activities (30% in 1980). Other activities that make up dispersed recreation are camping (other than in campgrounds), driving for pleasure, viewing scenery and fishing. It is these activities that comprise the remaining 70% of the 330,400 dispersed RVD's reported in FY 80. The change in deer habitat is only one factor in determining the projection of dispersed recreation use through time. A more influential factor in determining use projections was the population trends and past use trends within the Northern Region of the Forest Service. The impact of reduced habitat on the hunting use was reflected in a downward adjustment of the projected use trend. No assumptions were made regarding hunting permits, as the Forest Service has no control over their issuance. The use projections indicate the increase, reduction of increase or enhancement of increase of use trends on the National Forest System lands.

U The preferred alternative acknowledges the access need situation as evidenced by the access issue (ICO 4) addressed throughout the DEIS and Management Plan. The requirement to develop a current travel plan and identify access routes to the forest will certainly assist in informing the public of those lands available for use. The proposed level of harvest has been reduced in the Final EIS and therefore your concern about the deer habitat in the Long Pines has been recognized. We recognize the importanceof the scenery and the abundance of game to local and non-local residents. We believe that the preferred alternative in the Final EIS will be acceptable by the reduction in the harvest levels and the continuation of a high standard of visual resource management.

K23p6

The Plan should explain how recreation capacity and projected recreation use were determined in the planning process. X

We support additional recreation site development for the Ashland and Sioux Districts. These are important recreation areas for local communities. Existing sites should be maintained, and new sites should be developed rather than imposing use restrictions that may be difficult to enforce. Before closing any sites, the cost effectiveness of operation should be evaluated using realistic RVDs values of consumer surplus studies. Y

As with other forest plans, the values used by the CNF for wildlife oriented recreation are unacceptably low. For comparison, South Dakota has a civil value on its wildlife over and above any violation written by wardens. As of July 1, 1985 the new values are as follows: Elk, Buffalo, $5,000; Mountain Goat, Sheep, $10,000; Deer, Antelope, Bobcat, $1,000; and Turkey, small game (ouf-of-season) $500 per bird. Z

c. Trails.

Trails are essential to maintaining and increasing non-vehicular dispersed recreation, yet trails are not discussed in the alternatives or in the dispersed recreation sections of the DEIS. This is a major omission, especially since the road building program receives such detailed discussion. For each alternative the trail construction and maintenance program should be presented. Existing trail mileage, the trail mileage to be constructed and trail mileage lost because of extensive road building is essential information. AA

d. Recreation Capacity and Use.

The greatest recreation capacity is in the semi-primitive motorized and roaded recreation categories (DEIS III-17). The least recreation capacity seems to be in wilderness recreation as the capacity of the Absaroka-Beartooth (AB) Wilderness is expected to be reached by 1990 (DEIS III-17). This situation indicates that from a recreation perspective, wilderness and roadless allocations are needed more than roaded allocations. However, of the 258,280 acres available for roadless or wilderness allocations, only 31 percent is so allocated in the preferred alternative while 69 percent is allocated to roaded management. The rationale for this allocation needs further explanation in the final Plan. BB

4. Water Quality.

a. Watersheds.

Although the CNF has perhaps a lesser concern regarding water quality because of the amount of wilderness on the Beartooth District and low water producing areas in the eastern districts, the Watershed section of the DEIS should be strengthened. Runoff from the Beartooth watersheds is consistently high. Water quality and water yield monitoring is valuable where forest activities are planned. Erosion potential due to forest activities on eastern districts is high. Some streams could be affected by logging and grazing practices if precautions are not implemented to protect watershed values. CC

V You are correct in that the alternatives should reflect a range of recreation emphasis. We feel that the alternatives in the DEIS provide this. Because the Forest Service planning process is primarily issue-driven and the public demand for new and more recreation facilities was not identified as an issue during the public involvement opportunities, we feel justified in range of recreation opportunties provided in the DEIS. Please reference Chapter II of the DEIS for the explanation of the opportunities provided by each of the alternatives. Existing use of the Forest's developed recreation sites has not to date indicated gross inadequancies in capacities. Large capital investments were not considered to be necessary, rather heavy maintenance and expanding existing sites were deemed more appropriate.

W See response T. Projected use trends include resident and non-resident recreationists.

X Please be referred to Appendix B of the DEIS, page B-58. This section describes the recreation analysis process. Dispersed recreation was determined through the coefficient provided by the Recreation Opportunity Spectrum methodology, as applied to the Northern Region of the Forest Service. These coefficients were tailored to the Custer's situation. This analysis is part of the Planning Record.

Y We agree with your opinion that the recreation sites on the Ashland and Sioux Ranger District are indeed important to the local communities. There are no anticipated closures on these District, unless our budget prohibits us from assuring public safety. It looks as though we will be able to provide some additional recreation opportunities at Black's Pond on the Ashland Ranger District, providing the funding will hold up.

Z The values displayed in the EIS are "willingness to pay" values developed for the 1980 RPA Assessment. They are based on research conducted throughout the country and represent what the public is willing to pay for an RVD of recreation at the entry point. It is what the average person would be willing to pay if the Forest Service charged a fee for that recreational activity. This is additional to other expenses the visitor would have (hunting license or equipment for example). It does not include the economic value of an RVD of use to the local economy nor is it related to the civil value attached to wildlife species. The values vary somewhat depending upon the location, but these values were used consistently throughout the Northern Region.

AA The trail program on the Custer is discussed under the framework of dispersed recreation. The majority of existing trails currently occur on the Beartooth Ranger District within the Absaroka-Beartooth Wilderness. The management of the Wilderness is addressed in the Management Plan under Management Area I and Appendix II. Additionally, the management of the trail system is addressed in the Forestwide direction (draft Management Plan, page II-19)

BB The Forest planning analysis indicates capacity levels to be weighted against public demand. There had not been an indication of an unmet demand for wilderness and roadless allocations in Montana. We will try to clarify the rationale for the land allocations in the Final EIS.

CC The water quality section of the Final EIS has been expanded considerably. Reference Chapter II and III, Final EIS.

K2391

Statements should be included in the Watershed section specifically addressing water quality and how Best Management Practices (BMPs) will be applied during Plan implementation to ensure that CNF water quality goals and State water quality standards will be met. The Timber Facilities (road portion), Range, Soils and Minerals Sections should also include statements reinforcing this objective as agreed upon by the Regional Office. CC

Forest-wide practices (standards) that comprise BMPs for soil and water quality protection should be included in the watershed section on page II-36 of the DEIS. Also, the following standard should be listed in the a. Soil and Water Quality Management Section.

If it is determined during project design that the best way to meet the goals of the Forest Plan conflicts with a Forest Plan practice, the Forest Supervisor may approve an exception to that practice for that project; such exceptions must be described in the Finding of No Significant Impact/Decision Notice for the project, and the rational for making the exception must be documented in the project's Project File or Environmental Assessment. DD

The CNF is commended for addressing watershed impacts from brine spills, oil and gas exploration activities and toxic drilling fluids. However, management standards for soil and water are vague. Specific BMPs should be listed for each management area. EE

The recognition of the West Fork Rock Creek as the public water supply for the Town of Red Lodge is appreciated. Special water quality/land management activities and resource allocations must be considered in this watershed. FF

b. Project Planning.

A statement similar to the following should be included in the introductory text as agreed on by the Regional Office:

As part of the project planning, site specific water quality effects will be evaluated and control measures designed to ensure that the project will meet Forest water quality goals; projects that will not meet state water quality standards will be redesigned, rescheduled, or dropped. GG

Management practices specific to each alternative should be displayed to describe and assure that activities will accomplish Plan goals, one of which is to meet and/or exceed state water quality standards. Water quality considerations should be assessed in terms of impacts by alternative even if BMPs are being implemented. HH

c. Sedimentation.

As agreed upon by the Regional Office, sediment production potential should be addressed in the following manner. The CNF must evaluate individual activities and their applicability to these suggestions. II

DD The BMP's agreed to with the State of Montana are now available as FSH 2509.22 (111 pages). They are incorporate into the EIS by reference to preclude a more voluminous document.

EE The application of specific BMP's will occur at the project level analysis.

FF The West Fork of Rock Creek is included as Management Area R. The forest-wide as well as management area standards and guidlines are water quality are applicable.

GG This addition to the project planning section of Chapter IV of the Forest Plan has been added.

HH The Forest Plan spells out the planned activities needed to implement the direction of Alternative 10 (the Proposed Action). The Forest Plan would become voluminous and awkard if all management practices specifc to each of the 18 alternative where included in the Plan.

II The water quality sections of the Final EIS in Chapters II and III have been expanded. Included is Table II-9 which ranks the alternatives as to relative risk in sedimentation. Factors considered were livestock production, timber harvest, road construction, and oil production.

K2398

Sediment production can be generated by both increased water yield from the CNF are timber harvest and grazing. Other activities that could contribute to increased water yield are clearly associated with road construction, mineral development, and site preparation following timber harvest.

Ground disturbance increases the risk of increased sediment yield in riparian zones. The actual risk of increased sediment yield will vary depending on the amount of soil disturbance. Roads in particular must be stabilized and disturbed sites must be revegetated to reduce sediment production.

A table displaying sediment producing activities by alternative should be included in the Plan. Even though road construction and timber harvest is low on the CNF, alternatives should be ranked as to their relative risk of affecting water quality and beneficial uses on and off the CNF.

II

Significantly increased timber harvest-related activities in the Pryor Mountains will increase sedimentation problems and aggravate an already serious habitat degradation problem caused largely by past timber harvest and grazing abuse of those watersheds.

JJ

d. Other.

Several management activities (page IV-6, DEIS) do not address potential water quality, soil or water-related impacts. These management activities, including timber harvest, road building, developed recreation, mineral development, and oil and gas development, normally have some potential impact. A brief description, by alternative, of the magnitude of each activity's potential impact on water quality, soils (erosion potential) and water supplies is needed. A description of mitigative measures should be included with each management activity.

KK

The definition for BMPs as stated in the Plan, should be included in the DEIS.

LL

5. Wildlife.

a. Timber Harvest.

We are concerned that the significantly increased level of timber harvest proposed will be detrimental to the species of main concern, white-tailed and mule deer, turkeys, cavity nesting birds and other old growth species. The history of the CNF has been a harvest of less than 1 MMBF/year. Fiscal years 1979, 80 and 81 have averaged 1.5 MMBF. Page 23 in Chapter V paraphrases our concern: "The remaining District (Sioux Ranger District) is considered to be cover limiting and timber harvesting is not necessary to maintain or increase provided capacity habitat."

While the CNF can allow for some increased timber harvest without significantly affecting wildlife emphasis in Management D areas , we question whether the CNF can accomplish the stated purpose of maintaining or improving wildlife habitat with the proposed harvest level of

MM

JJ The Final Forest Plan does not increase the timber harvest from the Red Lodge District and specifically the Pryor Mountains. Approximately .5 mmbf per year will be harvested from this District, some of which will come from other portion of the Red Lodge District.

KK Chapter IV of the Final EIS addresses the potential water quality, and soil or water-related impacts of those resource activities that can cause significant adverse impacts. Reference Chapter IV, Final EIS.

LL The definition of BMP's has been added to the Glossary of the Final EIS.

MM The timber harvest level for the Forest has been reduced in the Final EIS and Forest Plan. On the average 1.0 mmbf will be harvested from the Sioux Ranger District. Although this District is considered to be cover limiting, this harvest level will not adversely affect the main wildlife species of concern. In addition, wildlife implementation guidelines have been developed that are designed to insure the maintenance of quality winter habitats for while-tailed deer on the Sioux District. These guidelines set standards for the layout and design of timber sales. The use of these guideline in addition to the reduced harvest volumes on the District will helpo achieve the goals for the management areas.

K23P1

2.014 MMBF/year on the Sioux district for the first decade and 1.155 MMBF/year for the second decade. It would be especially helpful if the CNF's 50 year timber program were detailed on a Forest map. This would assist in long-range planning efforts to prevent serious wildlife-related conflicts. MM

The Plan states that the wildlife objective is to emphasize active management of the habitat. Yet pages II-65 through II-68 of the DEIS, indicate that minimum level management may provide greater benefits to wildlife than the Proposed Action. All alternatives should be realistically evaluated to assure that the management proposed for wildlife is not primarily a justification for maintaining a given commodity output. NN

Under Timber Harvest (Chapter II, page 35, Plan) it states: "Cumulative impacts on wildlife of past, present, and planned timber activities will be considered as part of the assessment for the 10-year timber program." This is an excellent, progressive step that we hope has been completed for the present 10-year program. This assessment should be included in the final Plan and EIS. OO

The CNF is commended for including Item 6 (Chapter II, page 35, Plan), which lists excellent steps to integrate wildlife goals into a timber sale analysis. Unfortunately, it appears that the basic assumption used to manage wildlife habitat is that significantly increased timber harvest will benefit wildlife. PP

Acres affected per year and volume/acre cut is as heavy in the wildlife areas (D) as in the timber areas (G). Area D cut is 9.31 MBF per acre and Area G is 8.62 MBF per acre (Plan, Chapter III, pages 24,40). On page 11 of Appendix I the table shows that in the first 20 years almost twice as much timber is cut from the wildlife emphasis areas as from the timber emphasis areas. Since the wildlife emphasis acreage is almost double the timber emphasis acreage, this indicates that timber harvest on the wildlife areas receives as heavy an emphasis as on timber areas. Because of this, the Plan should more clearly identify the distinguishing factors between Areas D and G that are intended to benefit wildlife on the CNF. QQ

In the first 10 year timber sale program (Appendix I, pages 12, 13) there are two noteworthy concerns. First is the Ashland District's Green Creek sale scheduled for fiscal year 1987. The sale is located in a wildlife emphasis area; however, an appropriate level of wildlife consideration has not been included in the sale. Because it has not been designed to take the sale. The sale should be revised to properly emphasize wildlife. Second, the "Memo To Individuals Interested In The Sioux District Of Custer National Forest" states: "In the....Chalk Buttes only firewood, post and pole cutting is allowed." However in FY 1991 a 1.4 MMBF sale is scheduled for the Chalk Buttes. This apparent discrepancy should be clarified. RR

b. Habitat Improvement.

We question the CNF philosophy behind habitat improvement for wildlife. In MA-D the overall objective for the area is: "...maintain and improve the long-term quality of the habitat for wildlife." The primary means SS

NN The mimimum level management alternative does not provide for the multiple use of the lands as required under NFMA. The intent is not to maximize any one resource at the expense of another and the goals expressed in the plan reflect the multiple use approach. Wildlife would occur on the land at some level even if there isn't any management for habitat. However the habitats would change as the vegetation changed and it is certain that at some time the timbered stands would age to the point where either insects and/or fire would cause a major portion of the area to undergo a simultaneous loss of the one of the key elememts for white-tailed deer, namely cover. Under normal conditions cover could be expected to return approximately 20 years after such an event, however during those 20 years the population of white-tailed deer would be at a minimum. It is certain that under a minimum management such an even would eventually occur, however it is impossible to predict the moment when the event would start. Therefore the minimum management analysis does not include such an event in the analysis, and thus the yiels over time are optimistic.

OO The assessment was considered in the preparation of the current 10 year timber sale program included in the Final Forest Plan.

PP We appreciate the compliment and refer you to the discussion of Comment H concerning assumptions about timber harvesting.

QQ The figures in the plan refected the volumes/acre that could be harvested if the area was clearcut. In the final plan the figures reflect the volumes available under various harvest strategies such as overstory removal, and regeneration harvests (shelterwood, seed tree and clear cuts).

RR The Green Creek Sale on the Ashland-Fort Howes Ranger District is scheduled in the current 10 year timber sale program. This sale has been redesigned with input from Steve Knapp, Wildlife Biologist, State of Montana. Some of the cutting units have been dropped entirely while others have been redesigned.

It appears there is a misunderstanding concerning the information flyer on the Forest Plan for the Sioux District. The quote to which you have referred explains the timber management objectives under Current Management. Under the Sioux District Unit Plan the Chalk Buttes as well as the South Dakota portion of the District was not available for timber harvest activites. This Draft and Final Forest Plan proposes to change this to eliminate the concentration of timber harvest in such areas as the Long Pines Unit. Under the Forest Plan all land units of the Sioux District are available for timber management practices.

SS The volume of timber harvest in Alternative 1 has been changed to reflect the input of our wildlife biologist. This wildlife emphasis alternative would indicate that a timber harvest program of approximately 3.5 mmbf per year would be the optimum harvest level for wildlife.

K23p10

of improving wildlife habitat is amply shown in the DEIS (pages 11-15, g. timber) under Alternative 1, the maximum wildlife emphasis option. It states: "A high level of timber harvest (17.3 MMBF) would be scheduled annually during the first decade because of the forage, browse and hiding cover that harvested openings can provide for deer." Cutover areas can produce increased grass, forbs and browse which can be beneficial. Hiding cover or security is not produced by cutting and will take some time to return. 10-20 year old cuts in the Pryors are still without security cover. A plan documenting what improvements are needed in the game habitat, where they are needed, the species to be benefited, and how these cuts will in fact meet those improvements is necessary in the final Plan. SS

In addition, the CNF has not documented the most critical limiting factor or factors to the various wildlife species on the CNF. Without this fundamental first step, it is impossible to design a timber harvest or range management program which will have a beneficial effect on these limiting factors. TT

The supposed need, as seen by the CNF, is more forage, (Plan, page 23), "...(Beartooth and Ashland Ranger Districts) where forage is limited and openings would increase forage species." This is not an accurate statement. The condition of the deer harvested from the Ashland District is excellent. Also, additional openings may not produce the desired forage. Even if desirable forage were produced in opened-up areas, the additional snow accumulation might well make it unavailable when needed. Several of the areas along the Beartooth Face (Picket Pin, Squaw Gulch-Lodgepole) are timbered deer and elk winter range adjacent to grasslands. These timbered areas provide important thermal cover. The recommendations of the Final Report, Montana Cooperative Elk-Logging Study clearly state : "Timbered areas adjacent to primary winter foraging areas should be managed to maintain the integrity of the cover for elk." It also specifically states: "Logging adjacent to grassland winter ranges will normally be detrimental to elk." Preliminary radio telemetry work also indicates the Squaw Gulch-Limestone area is a high security area for wildlife during the hunting season. The conclusion, therefore, is that the proposed Plan has all the indications of weakening the known strong points of the habitat, without strengthening its weak points. UU

The goal for wildlife (Chapter II, page 1, Plan) states: "...the level of wildlife habitat management will increase over time." This statement does not coincide with Figure II-1 on page II-10 of the DEIS. Here wildlife habitat declines in comparison to current management. This needs clarification. VV

The CNF's goal of managing riparian areas and woody draws to avoid conflicting uses is very good. These types of vegetation are key wildlife habitats. WW

We support efforts to improve the condition and increase the capacity of big game winter range to reduce damage to adjacent private lands. However, big game security may be more important than habitat manipulation, especially in areas with sparse cover. XX

TT For the principal wildlife species of concern, principally game animals, identified limiting factors were identified. For mule and white-tailed deer, and elk, cover (both hiding and thermal) were identified as major limiting factors. Residual nesting cover was considered as the principal limiting factor for sharptailed grouse and prairie chickens. These factors were used in analysis of effects of various management practices on wildlife habitats.

UU Forage is an important conponent in the survival of wildlife throughout the year, as is cover. Assessment of limiting factors must take into account local needs. In the assessment for the forest plan, all winter ranges were generally categorized as cover limiting. This assessment was made recognizing the limited amount of forage available to white-tailed deer on the Sioux Ranger District and mule deer on the Ashland Ranger District. The winter range for elk was also designated as generally cover limiting. In general however, the winter range areas provided on the forest are small when compared to the summer ranges. A considerable amount of the Beartooth Face is not winter range as is almost all of the Pryor Mountains portion of the District. On the Ashland Ranger District the majority of the open ponderosa pine stands are not truly winter range, since the majority of the browze available is limited to the woody draws. This ecosystem constitutes a very limited amount of total acreage on the forest and thus the amount of forage avaiable to deer on the Forest Service administered lands is limited.

In the important cover areas, particulary those on or adjacent to winter rangers, it is important to recognize that the cover that exists is provided by trees and that for the most part these trees are old and it can be expected that at some future time they will die and will most likely be consumed by fire. Prudent management indicates that an orderly replacement of these stands will result in less widely fluctuations of habitat quality.

VV The level of wildlife management will increase over time as more and more demands are placed upon the limited acres to provide both commodites, services and amenities. Close coordination will be required to insure that wildlife values are incorporated into all project activities. The Forest is required to provide a mixture of goods and services and the allocation of management areas indicates what that mixture will look like on a certain piece of ground. As an example, management areas D will provide an increase in the habitat quality for wildlife while the key wildlife portions of the other management areas will be protected from major impacts from other resource activities.

In addition, during the analysis that was made concerning minerals activity, it became apparent that there was a great degree of unpredictability as to the location and amounts of gas and oil that might be located. As a result it was assumed that if an area was leased for gas and oil exploration then full development would follow. Under this assumption, if an area was leased for gas and oil, the result would be a decline in habitat quality for 10 or more years after leasing. It is closer to a worst case analysis than what is likely to happen even when oil prices were at $30 a barrel. The current decline in the price of oil will certainly slow down exploration and development.

K23P11

c. Grazing.

We commend the CNF for recognizing the problem of livestock overgrazing in its goal statement. Specifically, we are concerned with the effects of grazing on antelope and sharp-tailed grouse. Some new work in Idaho looks at the effects of range vegetation on antelope fawn predation. Vulnerability to both avian and mammalian predators increases when vegetation decreases. Avian predators (golden eagles) seem to be more successful where vegetative cover is low. Mammalian predators (mainly coyotes) are more successful where cover is not homogenous and vegetation clumps are used for bedding. When there is a layering effect of vegetation, not just sage with bare ground, it appears that the safety of the fawns is greatly improved. On the Ashland District, antelope fawn recruitment has usually been in the 50's or 60s fawns/100 does compared to 80s or higher region-wide. At least part of this could be attributed to the problem just described. Before the AUM increases take place, improved range management should be implemented in areas with existing problems with grazing intensity and distribution. YY

d. Cover.

The Plan contains a serious misrepresentation of what composes thermal cover for big game and what the effects of timber harvest are on several widlife species, especially deer.

In Chapter II (Table II-1) items T20 and T21 total 315 acres per year of thinning timber stands using timber stand improvement (TSI) and Knutson-Vandenberg (KV) monies. This is a concern since thinning can at times be more detrimental to cover and thermal requirements for big game than logging. This will inhibit a stand's return to adequate thermal cover, especially if additional acres are added to the thinning objective as happened in recent years. This important activity is not mentioned in the description of management areas where logging is proposed to take place. We suggest that no required acreage for thinning be proposed, but that the amount of thinning be decided by the forester designing the sale and that thinning be financed primarily with timber receipts. Since the timber on the CNF is in the two lowest productivity categories (Plan, Appendix I, page 6) an explanation of why thinning is viewed as economically viable is needed. ZZ

In 1990, the Double F sale will be proposed in the Long Pines section of the Sioux District. This is immediately adjacent to the Belltower I sale that is being cut in 1985. There will not be time for the first sale area to regenerate and provide cover benefits to wildlife, yet both these sales are within Management Area D (widlife emphasis). AAA

In 1989 the 1.5 MMBF Opeeche Sale will be offered in the Ekalaka Hills. In 1993, the 2.5 MMBF Gundlach Sale which is immediately adjacent to and basically an extension of the Opeeche Sale will be offered. Only 4 years separate the two sales. This allows barely enough time for regeneration, especially since sale contracts often run 3 to 5 years. The Gundlach Sale is mainly in a wildlife emphasis area. A very important aspect connected with cover needs is roads. As roading increases effective cover is reduced directly, resulting in an accelerated rate of harvest and/or displacement of big game into areas where security has been maintained. BBB

WW No response is necessary

XX Improving the winter ranges will require an evaluation of the principal limiting factors. If cover is identified as the principal factor then any plan developed will have to address it.

YY The states that residual nesting cover needs will be addressed in the formulation of range management plans. Cover and forage needs for wildlife are also addressed. The Forest provides limited habitats for antelope, however their needs will be considered in all management activities in the areas where they occur.

ZZ One of the main advatages of developing a comprehensive Forest Plan is the listing of all proposed activities, including thinning. Thinning is neccessary to improve timber stands where regeneration is abundant. However the need to replaced thermal cover has been identified as an important part of the management objectives particularly on white-tailed deer winter range. All thinning projects will meet the stated objective of replacing thermal cover in the proportions that it currently exists on the White-tailed deer winter ranges of the Sioux Ranger District. Thinning is justified to maintain stand health and vigor as wll as to provide benefits to other resources such as wildlife and grazing.

AAA The Double F sale has been dropped from the current 10 year plan. It will be resheduled in the future when regeneration cover is adequate for wildlife needs.

BBB The recently approved white-tailed deer timber harvest guidelines sets the stage for considering cumulative effects of timber harvest. Each sale will involve dispersed units over a larger area. Units will not be adjacent to one another until regeneration is adequate to satisfy cover objectives. This allows placement of sales near or adjacent to on another. As timber sales are designed, all resource needs and objectives will be considered in the project level analysis. Wildlife needs will be considered and roads closed or otherwise managed as needed.

K23p12

Under Deer/Elk, page 5, it states: "Management activities that disturb and/or disrupt these areas (riparian/woody draws) have the greatest effect on both white-tailed and mule deer." This is definitely not true for the white-tailed deer. Upland whitetails depend more heavily on the dense evergreen forests, for their presence. Changing the density and canopy coverage of such forests would have a greater effect on whitetails. CCC

We commend the CNF for suggesting the research needs for wildlife, specifically the cover needs of white-tailed deer on the Sioux District and adequate nesting cover for sharp-tailed grouse and other ground nesting species. Turkeys are a major ground nesting species of the forest habitat, and the Ashland and Sioux Districts are the Major Public Land Habitats for the wild turkey in the State of Montana. DDD

e. Indicator Species.

Sensitive species are listed in Appendix VII (page 5) of the Plan. Portions of the CNF in Montana harbor low population levels of mountain lions. The Ashland district and the Ekalaka Hills have them, and it is highly likely that the Chalk Buttes and Long Pines also do. Consequently, the mountain lion should be listed on the sensitive species list for Montana as well as South Dakota. EEE

Habitat indicator species are discussed on page 8 of Appendix VII. For old growth, the goshawk is considered an indicator species, however, it is doubtful whether goshawks inhabit vast regions of the CNF. There is no doubt they are not year-round residents. The wild turkey roosts and partially feeds in old growth; nesting would also occur in this habitat type, and depending on the understory may find effective hiding cover and wintering areas. As a year-round resident, it is sensitive to habitat and management regimes. The wild turkey would be a superior indicator species for the old growth habitat type. FFF

To use the white-tail deer as an indicator for the dog hair ponderosa pine type is not correct. The habitat most needed and used could be described as 3-story uneven aged ponderosa pine. This is habitat that would have mature saw timber (70+ years) as an overstory, with immature saw timber as an intermediate level and a combination of stagnated stands, pole stands and seedling/sapling stands as the lowest level. This habitat type offers critical thermal cover and also provides hiding cover. It is these critical habitats that must be monitored by the study of the whitetail as an indicator species. GGG

f. Birds.

Chapter II, page 65, DEIS states: "The upland bird populations, including grouse and pheasant, run a close second in public concern." There are very few pheasants inhabiting the CNF. The inclusion of wild turkeys would be more appropriate since the CNF is the main public land habitat for turkeys in southeastern Montana. HHH

Table II-11 in Chapter II, page 85 of the DEIS and Figure II-7 in Chapter II, page 67 of the DEIS show no change in grouse effective acres under the proposed alternative. The errata sheet of the DEIS III

CCC The Custer National Forest extends into North and South Dakota covering over 1,000,000 acres of grassland. In these areas the only vegetative cover available both white-tail and mule deer is contained in the riparian and woody draw ecosystems. From an Forest-wide perspective it is reasonable to state that disturbance to these ecosystems has the greatest effect on deer. In the dense timber stands of the Sioux and Ashland Ranger Districts it is true that changes in the density and canopy coverage would have the greatest effect on the deer habitats.

DDD During the analysis for the Forest Plan it became apparent that the amount of research supported information concerning responses of wildlife to changes in their habitats was severely limited. Efforts are underway to work cooperatively with the Montana Department of Fish, Wildlife and Parks to identify the research needs and assisting in finding funding to address these needs.

EEE Evaluations are underway to determine if the mountain lion should be included as a "sensitive" species.

FFF In 1985 a goshawk nest was discovered on the Ashland district. While it is true that the large amounts of territory required by this species limit its effective use as a habitat indicator for areas such as Ashland, there are only a few other factors beside old growth that can dramaticaly affect their numbers. Generally speaking, a hunted species should not be use as a true indicator of habitat conditions, because of the additional variable such as hunting mortality introduces into any assessment of habitat changes versus population changes. Exceptions to this rule were made as in the case of the white-tailed deer and dog-haired stands of ponderosa pine due to the limited amount of these stands in the area. Despite the strong needs for thermal cover exhibited by white-tailed deer, it will still be difficult to assess impacts to populations from habitat manipulations.

GGG The principal component of thermal cover that presently exists on the Sioux district is dense "dog hair" stands of ponderosa pine. The best areas of thermal cover do indeed have a three layer canopy and management will strive to provide the best quality thermal cover possible. However the principal component of the three layer stand is the dog hair pine since it alone provides the all the neccessary protection from the elements at least to some degree. Since this type is extremely important to white-tailed deer and they are the principal users of it, they were selected as indicator species for it, despite the variable introduced by hunting.

K2.3P13

shows a gain of 2,000 effective acres, but this is questionable when it also shows a 19,000 AUM grazing increase. When compared to the current management, grouse and deer all show substantial decreases. The proposed alternative appears to provide less emphasis on and concern for wildlife than present management.

III

The CNF's designation of 120,800 acres as essential peregrin falcon habitat is excellent. However, special stipulations should be identified to protect ferruginous hawks and other ground-nesting raptors from mineral-related disturbance.

JJJ

If the rimrock ecosystem of the Sioux District in southeastern Montana is vital habitat for raptors, it should be included in Management Area C and managed as a wildlife or grazing area.

KKK

g. Management Area Direction.

1. Management Area B.

According to Chapter III, page 39 of the DEIS, 10% of the Sioux District and 38% of the Ashland District is in poor to fair range condition. Past experience indicates that the riparian areas usually bear the brunt of this damage. It also indicates that the existing range program is not working well. Of special concern are the adverse effects on antelope and sharp-tailed grouse populations. As mentioned earlier, a strong correlation exists between a reduction in range vegetation and a reduction in antelope fawn survival.

LLL

We would like to commend the CNF for their excellent statements in the upland game bird section on page 7 of Appendix VII. Specifically, "Both sharptail and greater prairie chicken require a 12-inch height of vegetation for successful nesting. Since these species nest early in the spring, only vegetation from the previous year can meet their residual nesting cover requirements. This residual nesting cover was considered the limiting factor on populations of these species." Working toward this objective in concert with the antelope information listed above, the range program should benefit both the grassland and wildlife resources.

MMM

It is unclear how monitoring of riparian areas will be accomplished. Monitoring needs to be focused in riparian areas that are among the sensitive and valuable wildlife habitats on the CNF.

NNN

We recommend rest-rotation grazing forest-wide as a necessary tool to improve two of the most important rangeland habitats, grassland and riparian. Stocking rates, range readiness dates and allotment design and layout should be carefully considered.

OOO

Under Range 3c it states: "Non-structural improvements will be utilized where necessary to improve forage production for livestock and wildlife." We suggest a change in this sentence

PPP

HHH The Custer National Forest extends into North and South Dakota, and does have some habitat for pheasants, however it is true that turkeys are of major importance. The Final EIS has been changed.

III The wide diversity of lands and habitats on the Custer constrains generalized interpretations. In the final version of the plan, no additional AUMs are identified. Effective acres for sharptail grouse are affected by the type of management system applied to an allotment. If the current system is season long grazing, and this is changed to a four pasture rest roatation system and residual nesting cover is one of the objectives for the system of rotation, it is possible to increase AUMs slightly and also increase the amount of effective habitat for sharptail grouse.

JJJ The direction has been amended to include protection for active nests of ground nesting raptors. This protection is given to raptors as part of the standard stipulations included at the time of leasing.

KKK The rimrock ecosystem is listed as a part of Management Area C.

LLL The riparian zone has been identified as a seperate management area with its own set of management directions.

MMM Management direction is to incorporate residual nesting cover in all analysis for allotment management plans.

NNN The Monitoring and Evaluation section of the Forest Plan provides the framework for the entire monitoring aspect of the Plan, including the riparian and woody draws ecosystems. The Forest will continue to use such things as range analysis, production and utilization studies, and photo trend studies for example. In addition, as budget become tighter, the Forest envisions using data from other agencies as well as that from research.

OOO Rest-rotation grazing is a valuable tool that, when properly applied, can improve a vaiety of rangeland habitats. It is a tool which the Forest has not made adequate use. However, it may not be appropriate Forest-wide. In the end each allotment must be considered on a case-by-case basis.

PPP The change you have suggested has been made in the Final Forest Plan. Reference Management Area B.

K23p14

to: "...forage production for livestock and cover for wildlife." The reason for this change is that the general habitat type for this management area is open pine stands and grassland. In both these habitats cover rather than food would be a limiting factor, for example, tree cover for deer and turkeys and grass cover for sharptails and other open area ground nesting birds. PPP

We suggest one additional section stating: "Implementation plans will be developed for methods to integrate the management direction for Management Areas M and N into an overall management program." QQQ

Under Minerals and Geology there are stipulations to minimize impacts to key wildlife habitat. We suggest the following: "Regulate access and activity on winter range for mule deer, white-tailed deer, turkeys and grouse. Consider annual variations in weather and snow conditions which determines use of these ranges. Timing of activity to reduce potential conflicts would include avoidance of activity during seasonal use periods. These periods would be between December 15 and April 15." RRR

Under the Schedule of Management Practices it lists burning 50 acres/year for the first decade and 87 acres/year for the second decade for wildlife habitat improvement. We suggest that on an east-side forest this objective may soon become burdensome. We recommend amending this figure to 10 acres/year with the option of lumping several years objective into a single burn. SSS

Range in poor to fair condition will contribute to noxious weed problems unless the range actually improves. Chapter III, page 49 of the DEIS states that there are approximately 10,000 acres currently infested by noxious weeds. It also states that "In spite of the acreage treated each year, the number of acres infested has tended to increase." We suggest that this is tied to historical improper grazing management and that spraying weeds treats symptoms and not the cause. Continuous, intensive grazing, especially during the critical spring period, and in some cases, overstocking, have contributed to the noxious weed problem. TTT

2. Management Area C.

Under the Schedule of Management Practices, 40 acres/year in the first decade and 80 acres/year in the second decade are scheduled for burning to improve wildlife habitat. In a relatively small management area this may be too much. We suggest dropping this to 10 acres/year with the option of putting several years objectives together for a larger burn. Mule deer and whitetails should be listed as important species. UUU

331

QQQ Since the riparian and woody draws transcend most management area boundaries, it will be critical to insure that the management direction for these areas is implemented and not compromised. This will be accomplished mainly through the monitoring and evaluation.

RRR There is a limited amount of winter ranges on the Custer National Foreest. The ones that do exist have been identified and the general dates for occupancy have been developed (Forest Plan Chapter II page 32) in coordination with state Fish and Game biologists. The forest can close roads at any time due to resource problems, including an unusualy early winter.

SSS The figures listed are for the entire forest, including North and South Dakota, and represent an average annual estimate of activity. Management options include lumping the activity into large units in some years and no activity in others. The final plan identifies 190 acres (average annual) of habitat improvement in Management Area B. This represents 0.00016% of the management area.

TTT No doubt disturbance of any sort can contribute to the establishment of undesirable plants. In the Final Forest Plan, no increase is projected in livestock grazing. Livestock grazing will be held at or near current numbers. This coupled with intensive grazing, and expanding technology for biological control of noxious weeds should allow for the control of weed species at indigenous levels.

UUU The figures listed are for the entire forest including North and South Dakota. The final plan identifies 14 acres (average annual) of habitat improvement in Management Area C, this represents .0002% of the Management Area.

K 23015

3. Management Area D.

The goal for this management area is to maintain or improve the quality and diversity of wildlife and fish habitat. The Plan should commit to cooperative efforts with the Montana Department of Fish, Wildlife and Parks (DFWP) to achieve this goal. VVV

Elk and bighorn sheep should be listed for consideration in this area. Black bears and moose are also important in the Island Lake, Fishtail, and Fiddler Creek areas. WWW

The last sentence under the heading "Goal" states: "In key wildlife areas, resource conflicts that cannot be successfully mitigated will be resolved in favor of wildlife habitat." To make this statement more in line with similar statements in other sections, notably timber, we suggest that the first four words of the sentence be omitted so it would read: "Resource conflicts that cannot be successfully mitigated will be resolved in favor of wildlife habitat." Since area D is proposed for management for wildlife emphasis, the whole area is acknowledged as key. XXX

Under the Timber heading, (Chapter III, page 20, section a, Plan), the following sentence should be inserted after the second sentence of the paragraph: "Silvicultural systems such as individual or group selection systems will predominate." This sentence already exists in the B management areas which have less wildlife emphasis than D areas. Existing wildlife publications recommend individual or group selection systems as the way to benefit wildlife through timber harvest. These systems promote diversity in forested habitats. YYY

Under the same heading (section b) the first statement reads: "Knutson-Vandenberg funds collected from sale of forest products will first be programmed for regeneration or improvement of the stand." This is not the best use of these funds to benefit wildlife habitat, since it usually means thinning the timber stands. Thinning may be more detrimental to wildlife habitat than the timber harvest. The statement should read: "Knutson-Vandenberg funds collected from sale of forest products will first be programmed for direct wildlife habitat improvement in consultation with the DFWP." The reason for this is that in Management Area D, K-V funds should be regarded as mitigation funds for wildlife. ZZZ

The Minerals and Geology section includes stipulations to minimize impacts to key wildlife habitat. We suggest the addition of the following: "Regulate access and activity on winter range for mule deer, white-tailed deer, turkeys and grouse. Consider annual variations in weather and snow conditions which determine use of these ranges. Timing of activity to reduce potential conflicts would include avoidance of activity during seasonal use periods. These periods would be between December 15 and April 15." AAAA

VVV The Forest Plan is heirarchial indicating that all the Forest Plan General Direction will be met on all managemnt areas, and in the General Direction states that coordination with state agencies will be continued (Chapter II page 24).

WWW The wildlife species of black bear and moose have been added as important species for Management Area D

XXX The goal statements have been modified in the Final Forest Plan.

YYY The direction has been changed to state that both even aged and uneven aged silvicultural systems may be used.

ZZZ The direction has been changed to show that the Knutson-Vandenburg Act requires that funds collected under the act be spent to insure the regeneration of timbered stands. After regeneration, monies can be spent to address the most immediate concerns.

AAAA In the Forest-wide direction (Chapter II page 32 of the final) the general dates of occupancy of the winter range are given for selected areas across the forest. These dates were developed in coordination with the State Fish and Game Departments. The direction includes the provision that these dates can be varied in any one year due to climatic conditions.

K23916

The table entitled Schedule of Management Practices (Chapter II, page 24, DEIS) has several questionable figures. The figure for burning is 210 acres per year for the first decade and 368 acres per year for the second decade. We suggest this is much too high. Areas to burn will quickly become difficult to find. Burning on east-side forests is not as effective or necessary as on the west-side, except in aspen stands. BBBB

4. Management Area F.

"Closing facilities will be considered if public safety or sanitation cannot be provided or if operation of the site is not deemed to be comparatively cost effective" is not an acceptable alternative. The Ashland and Sioux Districts in Montana have a total of only 8 sites, most of these in low operation status. Considering the Plan's projected increase in recreation, we think that improvement of these areas and projecting the possibility of new site locations should receive priority consideration. CCCC

5. Management Area G.

The wildlife standards for Management Area G (Chapter III, page 37, Plan) should be made more specific to include a description of the types of activities that will be allowed in important wildlife areas and the types of mitigation to be used, including how roads will be managed. DDDD

The Plan states that Management Area G is not considered critical big game winter range. DFWP's data indicates that this is not the case. The Ekalaka Hills and Long Pines are critical winter range for whitetail deer, and the boundaries on the proposed action maps in the Plan should be revised to reflect this fact. EEEE

The Minerals and Geology section include stipulations to minimize impacts to key wildlife habitat. We suggest the addition of the following: "Regulate access and activity on winter range for mule deer, white-tailed deer, turkeys and grouse. Consider annual variations in weather and snow conditions which determines use of these ranges. Timing of activity to reduce potential conflicts would include avoidance of activity during season use periods. These periods would be between December 15 and April 15." FFFF

Under Schedule of Management Practices, the proposed amount of annual timber harvest in Management Area G appears to significantly limit a meaningful incorporation of wildlife values. The proposed burning of 154 acres/year for the first decade and 270 acres/year for the second decade to improve wildlife habitat is excessive and questionable. GGGG

BBBB The figures listed are for the entire forest including North and South Dakota. The final identifies an average annual figure of 55 acres for the first decade and 140 acres average annual for the second decade. These figures represent .0002% and .0005% of the total acres in this management area.

CCCC The Forest has every intention to keep as many sites open as we can in light of fiscal austerity. We recognize the importance of the rural campgrounds on the Ashland and Sioux Ranger Districts (reference management concerns, Chapter I, Final EIS). Their maintenance and administration is commensurate with their use. Because we do not expect any budgetary relief in the near future, we will seek reasonable alternatives to closing a site, such as volunteers, campground hosts or shortened seasons. If a site receives little use, or safety and sanitation can not be assured, it will be closed, according to Forest Service policy.

DDDD Road management needs varies widely by management areas. All road management within a Management Area will be consistant with the direction and goals for that area. Specific direction that would address the local situation is best handled at the project level.

EEEE The boundaries to Management Area G in the Long Pines and Ekalaka Hills have been changed to critical big game winter range. These areas have now been included in Management Area D. The wording in the description of Management Area G has also been changed to reflect the inclusion of some winter range within this management area.

FFFF See response under comment AAAA.

GGGG The management direction applies to all the lands across the forest including North and South Dakota. The final plan identifies 14 acres of treatments (average annual for the first decade). This constitutes 0.0003% of the management area.

333

K-23917

6. Management Area M and N.

The comments on ways to protect or improve deciduous species are good. Under Schedule of Management Practices, we suggest that in areas where ponderosa pine is clearcut to allow for aspen regeneration, the border of the clearcut be planted with a species such as Russian Olive. This would increase the diversity of the site and possibly prevent or retard reinvasions of ponderosa pine. HHHH

Range guidelines for riparian areas in Management Areas M and N are too general and need to be more specifically identified. It is difficult to determine what, if anything, will be done to protect riparian areas. IIII

h. Forestwide Management Standards and Goals.

We suggest a "food plots" program (Chapter II, page 27) whereby temporary logging roads are closed by re-seeding with fruit-bearing shrubs, such as chokecherry, rose, snowberry and Russian Olive. JJJJ

Mitigation measures 3a-h (Chapter II, page 27) are commendable. However, 3i is ambiguous. We assume if the MA is wildlife emphasis, grazing systems will provide residual nesting cover on prairie grouse areas. KKKK

Item 2 in Range Analysis and Allotment Management (Chapter II, page 31, Plan), mentions unique vegetation. We suggest specifically mentioning the need to actively protect or develop riparian areas and woody draws. In item 5f, which considers improving range resource for other uses, we suggest specifically mentioning efforts to produce residual cover for ground nesting birds, notably sharp-tailed grouse. The conflict between heavy livestock grazing and ground nesting birds, is one of the largest, most long-term and least recognized problems on the CNF. LLLL

Page 34 of Chapter II in the Plan states: "On winter ranges for big game and sage grouse, sagebrush control may occur after a vegetative plan for wildlife habitat is developed for the winter range." This statement appears to be favoring range on established and known wildlife range. We suggest adding the following statement: "Any unresolved differences will be settled in favor of wildlife habitat." MMMM

Large portions of the Ashland District were sprayed several years ago for grasshopper and cricket control and the possibility of spraying exists this year. Spraying occurs after the peak of hatch for sharp-tailed grouse and other birds when they rely most heavily on grasshoppers and other insects for protein needs. We are very concerned about future spraying in wildlife emphasis areas. We recommend incorporating the following statement into the CNF Plan from the 1976 Sioux District Land Management Plan: "No chemical control of grasshoppers in primary turkey and sharp-tailed grouse feeding habitat." NNNN

HHHH Planting of food and shelter species around clearcuts for aspen can be accomplished. We will coordinate with the state fish and game biologists at the project level.

IIII The goal for the riparian and woody draw areas states that they will be managed for to provide healthy, self-perpetuating plant and water communities with optimum diversity. Strategies to acheive this goal are identified in the plan. An inventory of projects would be premature since there is still the opportunity to develop inovative approaches to the situation that may prove beneficial.

JJJJ When a road is closed, a mixture of seed is generally applied. We will cooperate with the Department of Fish Wildlife and Parks to identify the most desirable mixture to meet the objectives which include reducing soil erosion.

KKKK The forest plan is hierarchial and the forest direction applies to all management areas, while the direction in the particular management areas applies only within that area. The direction to address residual nesting cover in the forest direction then will apply to all management areas, not just those with a wildlife emphasis.

LLLL Your suggestions have been incorporated into the Forest-wide direction portion of the Forest Plan.

MMMM The forest direction applies to all management areas and was written to be applicable to all areas.

NNNN The forest has the responsibility to protect all resources, including wildlife and the vegetation as well as eliminating reservoirs of grasshoppers that could spread onto private land. Large scale elimination of areas that could be chemicaly controlled for grasshoppers would not meet the all the responsibilities the forest has for all resources. Widespread chemical control of grasshoppers does not occur until there is an economic infestation of these insects, which is generally 8 or more grasshoppers per square yard. Until these density of grasshoppers is reached in an area, widespread chemical treatments will not occur. Wildlife concerns will be addressed at the project level and localized areas of concentration can be avoided.

K 23 p 18

We suggest more access be provided to the Chalk Buttes (Chapter II, page 2, Plan) to help meet the public access and goals. OOOO

i. Land Allocations.

Site specific comments prepared by the DFWP regarding the CNF's proposed land allocation are included in these comments as Appendix B.

j. Other.

The CNF Plan should delineate areas included in Grizzly Bear Management Situations I and II. If possible, forest managers should meet the grizzly bear population and habitat goals included in the Grizzly Bear Recovery Plan. PPPP

Prairie dog management goals are very good. Prairie dog control should be coordinated with the Montana Department of Agriculture, DFWP and county rodent control officials. A predator control strategy should be developed and included in the plan for public review. The predator control strategy should list proposed control methods, criteria for determining if control measures are necessary and any priorities for predator control. QQQQ

Chapter II, page 21 of Plan lists the maximum number of progressive sheep hunting camps allowed by drainage. The West Rosebud, a popular sheep hunting area, should be included. RRRR

6. Fisheries.

a. Streambank/Riparian/Grazing.

Damaged streambanks and riparian vegetation resulting from overuse by livestock is evident in the upper reaches of Sage and Crooked creeks, both important fisheries in the Pryor area. The CNF Plan needs greater emphasis on improved grazing management to avoid continuing damage to streams and riparian areas. Initiation of improved grazing systems to avoid overuse and increased fencing and development of offstream watering areas, would do far more to protect the stream ecosystem than the proposed installation of fish habitat structures. SSSS

On the Beartooth Face several important streams may suffer from deteriorating habitat if grazing is intensified as proposed. These streams include Trout Creek and Bad Canyon Creek, which support fisheries on the CNF and are tributaries to the Stillwater River, and West Red Lodge Creek, which supports a valuable fishery and is an important tributary to Rock Creek near Red Lodge. The issue of intensive grazing of riparian zones, as it affects important fisheries, should be better addressed in the Plan. TTTT

OOOO One of the major goals of the Forest as stated in Chapter 2 of the Forest Plan is to improve public access to and within the Forest. The Chalk Buttes is an area that improved access is needed.

PPPP The biological assessment for the forest plan addresses the issue of recovery plan goals. Reference Appendix E to the Final EIS. The recovery plan is currently (spring 1986) being updated and the forest will participate in this process.

QQQQ The document includes the direction to coordinate all annimal damage control with the appropriate state and/or federal agency. The forest manual (2650) identifies criteria for predator conrol.

RRRR The West Rosebud drainage is included in the Final Forest Plan.

SSSS The Forest Plan provides the management direction for riparian areas and woody draws. Initiation of improved management systems and fencing may be used to improve the conditions of these areas. Specifically, the Sage Creek and Crooked Creek areas will be addressing in upcoming AMP's.

TTTT The level of livestock grazing on the Forest has been reduced in the Final Forest Plan and EIS. On most of the allotments on the Red Lodge District, livestock grazing value are considered to be of lesser importance than the watershed and wildlife values.

K23 p19

Management Area F portions in the Beartooth district are corridor areas providing access into the wilderness. As such, they contain a large percentage of the riparian zone for major fishery streams existing in the CNF. Because they are subjected to intense human use, greater emphasis in the Plan needs to be placed on protection of these riparian areas. Continued livestock grazing in these areas should be more carefully considered, and long-term water quality monitoring plans to protect these fisheries better delineated. Emphasis should be placed on protection of the wild trout fisheries that exist in these streams because the wilderness itself offers limited stream fisheries. At present, the fishery is addressed only briefly as recreation when it should be a major focal point. UUUU

Management Area M consists of unmapped riparian ecosystem throughout the CNF. The Plan's initial description (Chapter III, page 63) seems to give riparian use by wildlife second priority behind providing shade, water and forage for livestock. VVVV

Range management standards for riparian areas are not adequate. The Plan states: "Management practices such as fencing, grazing, deferment, burning or planting may be tried on selected areas to determine their effectiveness in maintaining or improving the riparian zone conditions." There is no question but that removal or reduction of livestock use of riparian areas will improve conditions. The vague wording of the proposed range management standards makes it appear as though the CNF will condone poor riparian grazing management. These standards should be improved in the final Plan. WWWW

Installation of stream habitat improvement structures in overgrazed areas is not satisfactory. In most cases, the best improvements that could be made are range improvements, such as off-stream watering areas. The money allocated to stream habitat improvement structures would be better spent obtaining water for livestock and fencing the stream bottoms, allowing damaged riparian vegetation to regenerate. XXXX

Management Area G (20,107 acres in the Beartooth Ranger District) consists of six parcels of land to be managed for wood products as the highest priority. Care must be taken to assure that the area's fishery values are not sacrificed for timber sales. The Plan acknowledges but does little to address potential impacts of "streambank/shoreline vegetation and siltation potential" on the fisheries of these areas. This should be corrected in the final Plan. YYYY

The Plan should identify its criteria for determining "adequate" tree and shrub vegetation necessary to maintain bank and stream cover. ZZZZ

Timber management standards should eliminate clearcutting in riparian zones. This is inapporpriate in any circumstances. Buffer zones should be at least 100 feet in width, not 30 feet. While the determination of instream flow needs is a commendable CNF goal, the Plan stops short of the most important aspect of instream flow work, i.e., filing of water rights for the needed flows. AAAAA

18 — p# missing.

UUUU Although the major access corridors on the Red Lodge District are within Management Area F, they contain the bulk of the riparian zone on the Forest. As such, the management direction in MA M will apply to the riparian portion of this area. This direction will provide the necessary protection for the important stream fisheries.

VVVV This wording has been changed in the Final Forest Plan.

WWWW The management of woody draws and riparian areas continues to present a challenge to the Forest. Livestock use in these areas can be very demanding on the resources, and the ecology of these areas—especially woody draws—is not completely understood. Improving the range condition of these areas does not appear to be as simple as reducing or terminating grazing altogether. The current literature suggests that:

"Vegetation in meadows and drainageways is closely utilized (by livestock) under any stocking rate or system of grazing. Reducing the livestock or adjesting grazing seasons usually will not solve the problem". (Amour, C.L. 1977. Effects or deteriorated range str4eams on trout. Quote from A. Hormay, personal communication).

Recent research from the Rocky Mountain Forest Research Laboratory, Rapid City, South Dakota found that protection from cattle browsing made an important difference in development of sprout clumps (of woody species) but did not affect number of sprouts surviving after three years. Heavily browsed sprout clumps may or may not die. (Bjugstad, A.J. and M. Girard. 1985. Wooded Draws in Rangeland of the Northern Great Plains).

The Forest Plan provides for management practices such as fencing, more intensive grazing systems, water developments, and possibly shade sheltes to discourage use of these important areas by cattle. Monitoring of these special habitats is identified in Monitoring Items C4 and F4 (Chapter IV, Forest Plan).

XXXX In areas where there is damage to the riparian zone from livestock grazing, the intent is to address this situation through management practices that include adjusting season of use, movement of watering facilities etc. Placment of stream habitat improvement structures is intended to improve the fish habitat, not to remedy other problems.

YYYY The plan states that the riparian zone is not a part of the suitable timber base. In addition a significant portion of the G management areas that were identified in the Draft have been placed into Management Area D in the Final.

ZZZZ The goal for the riparian management areas is to provide healthy, self-perpetuating plant and water communities that will have optimum diversity and density of understory and overstory vegetation. This goal is applied to all riparian zones across the forest including the eastern harwoods areas of the Sheyenne Ranger district, the Little Missouri River and the streams along the Beartooth Face. Defining adequate tree and shrub cover for this variety of areas in one standard was not prudent. Definitions of what constitutes adequate vegetation will have to be made at the project level, or at least by district.

AAAAA Reference the response to Comment YYYY above.

K33P21

reconsider the Governor's wilderness recommendation outlined in his May, 1984 letter to Montana's Congressional Delegation. The Governor's recommendation calls for an 11,080 acre addition to the CNF portion of the wilderness system that would link the Lost Water Canyon area with adjacent areas proposed for wilderness classification by the BLM. A discussion of the wilderness values of these areas from the Governor's 1984 Wilderness Recommendations is attached as Appendix A for your consideration. Wilderness classification for this area would not conflict with the proposed Research Natural Area and Wild Horse Territory in the Plan. Cooperative management of the entire area with the BLM might facilitate wild horse management in the area if it is designated as a Wilderness Area. Oil and gas development and timber management planned for a small portion along the western edge of the Governor's proposed Wilderness Area should be deferred pending Congressional resolution of the area's status. FFFFF

The proposed roadless area allocation appears insufficient to meet the Plan's anticipated demand for primitive and non-roaded recreation on the CNF. The proposed action allocates only 63,000 acres of the 259,000 acres of inventoried roadless area to Wilderness or roadless management. However, Alternative 7, which emphasizes oil and gas production, recommends 102,600 acres for Wilderness and roadless management. Alternative 3, which has the highest present net value, recommends 128,200 acres, and Alternative 4, which represents no action, recommends 171,800 acres for roadless management. Forest planners should reconsider the roadless allocation in the proposed Plan and strive to retain the roadless characteristics of roadless areas to the extent possible as stated in the resource objectives (Chapter II, page 3, Plan). Structural range improvements like fences or stock watering facilities do not necessarily require roads and do not usually detract from the semi-primitive character of the land. GGGGG

337

It is unlcear exactly how much acreage is proposed to be added to the Absaroka-Beartooth Wilderness by the preferred alternative: The DEIS, Chapter II, page 38, states a net gain of 6,000 acres, in the DEIS Appendices B-168 the net gain is 4,100 acres, and the CNF Overview Plan, page 5 states that 5,150 acres will be added to the AB Wilderness. This inconsistency needs to be corrected in the final EIS and Plan. HHHHH

The wilderness use figures cited in the DEIS appear to conflict with the fishing use figures. If two-thirds of the 160,000 visitor days are concentrated along streams and lakes, it would appear the CNF's estimate of 48,000 angler days on the CNF underestimates actual angler use. IIIII

8. Roads.

The road management standards proposed for areas with a timber management emphasis are too general. In addition to the need to identify design criteria and reclamation requirements, criteria for determining if and when roads will be closed should be included in the final Plan. JJJJJ

The quantity and location of roads is also a concern. It appears that many of the new planned roads will not be obliterated after use, and will be added to the permanent road system of the CNF. The roading program proposed in the Sioux District in conjunction with timber harvest will deteriorate the high security cover for white-tailed deer necessary for trophy bucks. This area is gaining national recognition for quality deer hunting at the same time that KKKKK

GGGGG The low development and/or roadless emphasis by alternative has been re-analyzed and changed in the Final Forest Plan and EIS. In North Dakato, approximately 44,000 acres of land will remain in a low development management situation. This is in addition to the area in Mnagement Area C which has severe access restriction. In Montana, approximately 40,000 acres of the roadless inventory will remain in a roadless management prescription (Management Area J). In addition to this, much of the other inventoried roadless areas will not be developed unless oil and gas reserves are discovered and it becomes necessary to honor valid and existing lease rights.

HHHHH It is proposed to add approximately 11,800 acres to the A/B Wilderness. This has been clarified in the Final EIS.

IIIII Wilderness use is projected to reach an average annual level of 207,000 recreation visitor days (RVD) in the first decade (Reference Table II-18, Final EIS). The fishing proportion of this use is undetermined in this table. Fishing use for the entire Forest is expected to reach 44,000 RVD's in the first decade.

JJJJJ Specific road management standards will be addressed in the project level analysis that will be accomplished for each timber sale. If roads are not needed for long-term management objectives, they will be closed.

KKKKK The number of roads and related access points to the Forest will increase over time. Roads not needed for resource management will be closed seasonally or permanently.

K23 20

b. Stillwater River.

Management Area E (24,497 acres in the Beartooth Ranger District) consists of one large block in the "Stillwater Complex" which is being designated for energy and mineral development emphasis. The headwaters of the Stillwater River, the most important rainbow trout spawning tributary in the Yellowstone ecosystem, are located in this designation and include Cathedral, Flume, Iron, and Mountain View creeks. BBBBB

In 1982-83 nearly 50,000 fisherman days were expended in the Stillwater River drainage. The Plan must clearly indicate that the quality of this fishery will not be sacrificed in favor of headwaters energy or mineral development.

The Plan doesn't include management standards for soil and water in Management Area E. This is a significant oversight considering the importance of the upper Stillwater River, both on and off the CNF, as a sport fishery and as a rainbow trout nursery area for the mid-Yellowstone drainage. CCCCC

Long-term plans in Management Area E for up to six miles of road per square mile combined with intense human activity may jeopardize future water quality and fishery values on the Stillwater River unless additional measures are developed to assure protection of the area. The Plan falls short of addressing this; water quality monitoring is not even mentioned and emphasis is placed on rehabilitation, rather than protection. The CNF should develop a detailed, comprehensive water quality monitoring plan for the Stillwater River headwaters area. DDDDD

c. Management Area T.

In Management Area T on the Beartooth Ranger District, livestock grazing on the Rock Creek Allotment is scheduled to be continued, and timber harvest is proposed. This area contains several drainages that are sensitive to impacts from these activities. They are: Picket Pin Creek in the Stillwater River drainage which received a 1983 plant of fluvial arctic grayling and is presently being evaluated; East Fishtail and Fiddler Creeks in the West Rosebud drainage; and Burnt Fork Creek and the East Fork of West Red Lodge Creek in the Rock Creek drainage. Fisheries habitat deterioration caused by past timber harvest activities has previously been documented in some of these drainages. Lost Lakes in the West Rosebud Creek drainage may have future fisheries potential and may also be adversely affected. In addition, the stated objective of natural regeneration of timber harvest areas within five years for these drainages is highly questionable based on past performance in this area. EEEEE

7. Wilderness.

The preferred Plan proposes to add a total of 10,962 acres of wilderness to the CNF: 5,812 acres in Lost Water Canyon, and a 5,150 acre addition to the Absaroka-Beartooth (AB) Wilderness. We urge the planners to FFFFF

BBBBB The riparian management areas were not mapped due to the scale of the maps provided, however all riparian zones, including the Stillwater are identified as being included in the M Management Area (riparian). The direction for this management area includes protection and enhancement of the fisheries habitats.

CCCCC The Soil and Water management direction is sufficiently covered in the Forest-wide direction.

DDDDD Water quality monitoring is included in Forest-wide direction. Road densities may approach six miles per square mile but this level of development is expected only in areas of intensive oil and gas development, not in the Stillwater area.

EEEEE See responses to Comments BBBBB and YYYY.

FFFFF The Forest has not recommended the eastern portion of the Lost Water Canyon area for wilderness in the Final EIS and Forest Plan. This areas will be managed in conjunction with the BLM as part of the Pryor Mountain Wild Horse Territory. We believe that many of the management practices associated with wild horse management in the Pryor Mountains are incompatible with a wilderness designation.

K23p22

the CNF is proposing a management change. To reduce unacceptable impacts, the DFWP recommends no more than 2 miles of open roads per square mile of land area in CNF districts that are inhabited by deer. KKKKK

9. Energy and Minerals.

We encourage advanced planning and cooperation with oil and gas companies to ensure that development will have the least possible adverse impact. Management activities should strive to reduce potential impacts to other valuable forest resources. The mitigating resources proposed in the plan are good. Forest planners should carefully consider and apply appropriate restrictions in leases on key wildlife areas and desirable primitive recreation areas to minimize road construction and site development. LLLLL

The Plan's recognition that operators must comply with applicable state water quality standards and regulations as well as federal laws is appreciated. In addition to an operator complying with applicable federal and state water quality standards, regulations described in Title IV-Permits and Licenses, Section 401(a)(1), Clean Water Act should be followed before mining operations commence on the forest. MMMMM

The CNF is to be commended for carefully monitoring seismic testing noise spillovers into wilderness areas. We support continued monitoring recognizing that wilderness is also an important aspect of Montana's economic development. NNNNN

10. Fire.

Interagency coordination is discussed in Chapter II (page 58) of the Plan, but no specific mention is made of State or county fire programs. The Plan should specifically state that it will coordinate fire suppression activities with the Montana Department of State Lands. Further, the fact that all counties adjacent to (and included in) the CNF are enrolled in the County Cooperative fire protection program (administered by the Department of State Lands) should be clearly stated. OOOOO

11. Grazing/Range/Weeds.

The Plan proposes to increase AUMs by 38,000 over the planning period, even though the goal for livestock management addresses conflicts with other resources and overstocking problems. We fail to see how this proposed increase will resolve conflicts with other stated objectives such as protecting riparian/woody draw habitat, protecting and increasing the grassland resource, providing residual cover for prairie grouse and avoiding problems with noxious weeds and infestations of grasshoppers. PPPPP

One of the major uses of the CNF is livestock grazing. It appears that the CNF valued grazing at higher theoretical market values rather than actual grazing fees. Timber, however, was valued at expected revenues. The effect is the relative overstatement of grazing values to timber values. Recalculations should be made to provide more realistic information on which to base resource allocation decisions. QQQQQ

Management Area L is a proposal to create the 1,630 acre Lost Water Canyon Research Natural Area in the Pryor Mountains. The stated goal for this area is to provide an opportunity for study of "natural-occuring and RRRRR

LLLLL Our current Activity Coordination Analyses will continue. Mineral lease stipulations will be carefully considered as possible mitigation measures in key wildlife areas.

MMMMM All applicable State and Federal laws, including the Clean Water Act will be followed.

NNNNN No response is necessary.

OOOOO Although not specifically mentioned, coordination with State and local agencies is sufficiently covered in the Interagency Coordination section of Fire Management. See Forest-wide direction, Final Forest Plan.

PPPPP The proposed level of livestock grazing has been changed in the Final Forest Plan and EIS. The level of livestock grazing will remain at or near current permitted numbers.

QQQQQ The values displayed in the EIS are "willingness to pay" values developed for the 1980 RPA Assessment. They are based on research conducted throughout the country and represent what the public is willing to pay for an AUM or board foot of timber. In essence, the values used in FORPLAN represent "in sito" values of the resource. The values vary somewhat depending upon the location, but these values were used consistently throughout the Northern Region.

RRRRR Management Area L includes all current RNA's and well as those proposed for RNA classification. Grazing has historically occurred on many of these areas and will be allowed to continue. However, livestock grazing does not occur in Lost Water Canyon. Livestock grazing will not be instituted in this area in the future.

K23P23

ecological processes." Wildlife habitat improvement, recreational use, timber harvest, etc., are not allowed, but grazing by domestic livestock is proposed to continue. This combination is questionable, particularly given the fact that this narrow corridor-like area is bounded on either side by proposed wilderness (west) where domestic livestock are not allowed. It appears that grazing is the only "unnatural" use being permitted in the area. — RRRRR

Ideally, all CNF range should be in good to excellent condition. Range condition and trend should form the basis for management decisions and should be monitored more frequently than every 10 years. Common grazing allotments should be administered to prevent overgrazing. Grazing permit compliance should be evaluated whenever annual inspections reveal possible permit violations. — SSSSS

The Plan's goal for livestock management is to maintain the current stocking rate on the CNF. The flexibility to increase the stocking rate for permittees desiring to practice time-controlled grazing should be possible, at least on a limited, trial basis. Also, the use of sound livestock management to maintain or improve range ecosystem health should be stressed as a weed control method. — TTTTT

We support the adjustment of each grazing season based on long-term range readiness data. — UUUUU

The economics of watershed improvements such as pitting and furrowing should be carefully evaluated. Holistic resource management should be used on a trial basis as a watershed improvement tool. — VVVVV

Specific brush control and tree enroachment control measures should be included in the Plan for public review. Reseeding may be necessary on areas disturbed by prescribed fire or mechanical treatments like contour furrowing or pitting, to help reduce erosion and prevent weed invasion. The proposed weed control program is very good. We support the integrated pest management (IPM) strategies, treatment priorities, and monitoring requirements that are outlined in the Plan. — WWWWW

The rationale for closing the Line Creek and Face of the Mountains allotments should be explained in the Plan. Light grazing by livestock early in the season may improve the forage quality on wildlife winter range and increase the carrying capacity. Managers, however, should consider increasing the installation of structures (e.g., fence, water tank, etc.) near these areas to improve livestock distribution, reduce conflicts with wildlife, or improve water quality in riparian areas. — XXXXX

The Plan (Chapter II, page 31) should specify that the CNF will coordinate the development of allotment management plans with the Department of State Lands in areas where State-owned parcels are intermingled with federal lands. — YYYYY

In Management Area T on the Beartooth Ranger District, major emphasis is placed on preservation of scenic aspects of the "Beartooth Highway." Livestock grazing on the Rock Creek Allotment is scheduled to be continued. This seems inconsistent with winter range improvement for wildlife and watershed protection of this area. — ZZZZZ

SSSSS The Forest agrees that ideally all Forest rangelands should be at least in good condition. Depending on management objectives, rangelands in a seral status can be more productive than rangelands that have reached climax state. The monitoring of range condition and trend is an on-going task. However, normally the range analysis package which include for example the vegetative mapping/inventory, and condition and trend mapping, is put together approximately every 10 years. This may be done quicker if conditions warrant. Allotment inspections throughout the grazing season will be just one tool used to monitor compliance with the terms of a grazing permit/agreement.

TTTTT The Forest Plan estimates that Forest-wide livestock grazing will remain at or near current levels. This will be accomplished through adjustments over time on an allotment-by-allotment basis. The stocking on some allotments may be increased, while others will have to undergo reductions. If improved management increases forage production, and the allocation of this increased production to livestock is in "synch" with the goals for a particular management area, then livestock numbers could possibly be increased. In the end, each allotment must be evaluated on a case-by-case basis and the institution of a given system of management in and of itself is not sufficient reason to increase the level of stocking.

UUUUU No response is necessary.

VVVVV The Forest agrees that the economics of watershed improvement projects should be evaluated. However, this should not be the sole basis used in the decision making process.

WWWWW Specific measures such as the need to reseed will be discussed at the project level.

XXXXX The rationale for closing these allotments center around the high wildlife values and in general the economics of grazing within the allotments. We agree that light grazing may actually improve the quality of the winter range. The necessary range improvements to accomplish that make grazing somewhat unattractive to prospective permittees.

YYYYY This addition has been made.

ZZZZZ To some, livestock grazing is part of the scenic aspect of the West and in particular, eastern Montana. Present stocking levels on the Rock Creel Allotment will protect the scenic beauty and wildlife values of the area. As you mentioned, light grazing can improve the quality of winter range.

K23 p24

12. Monitoring.

Item C1 in the Plan discusses habitat changes from roads and oil and gas, but does not mention timber harvest. Timber harvest may well be one of the largest reasons for habitat change on the Ashland and Sioux districts, and should be considered a part of C1 monitoring.] AAAAAA

The needs listed for residual nesting cover for prairie grouse in item C9 are commendable.] BBBBBB

Water quality monitoring should be more frequent than every 5 years, and more than 20% of the disturbed watersheds should be sampled annually.] CCCCCC

13. Soil.] DDDDDD

Soils data is missing from Table II-1, Chapter II, page 6 of the Plan.

Soil rehabilitation measures and the frequency of monitoring should be identified in the Plan.] EEEEEE

341

AAAAAA This addition has been made to the Monitoring and Evaluation Section of the Forest Plan.

BBBBBB No response is necessary.

CCCCCC The section on water quality monitoring has been revised in the Final Forest Plan.

DDDDDD The soils data for Table II-1 has been added.

EEEEEE The soil monitoring needs has been identified in the Final Forest Plan.

FFFFFF The Forest has not recommended the eastern portion of the Lost Water Canyon area for wilderness in the Final EIS and Forest Plan. This areas will be managed in conjunction with the BLM as part of the Pryor Mountain Wild Horse Territory. We believe that many of the management practices associated with wild horse management in the Pryor Mountains are incompatible with a wilderness designation.

GGGGGG The size of Management Area G has been reduced on the Beartooth Ranger District between the Draft and Final Forest Plan and EIS to protect wildlife habitat. The classification of Special and Marginal are no longer valid terms. Special areas were those areas where timber was harvested to accomplish other objectives. Tehy are now included in Management Areas C and D. Economically marginal areas are no longer a part of the suitable timber base.

HHHHHH Subsequent to publishing the Draft EIS, the Forest met with representatives from the Montana Department of Fish, Wildlife, and Parks conerning management area boundaries on the Sioux and Red Lodge Districts. Some adjustment have been made in these boundaries.

IIIIII See response to Comment HHHHHH.

JJJJJJ See response to Comment HHHHHH.

K 23 p25

APPENDIX A

LOST WATER CANYON ROADLESS AREA - 01362

Forest: Custer
1983 Roadless Area Net Acres: 9,800
Recommended Wilderness Acres: 11,080

I. WILDERNESS ATTRIBUTES:

The Lost Water Canyon area is 45 miles south of Billings within the Pryor Mountains. The area is characterized by deeply incised, limestone canyons and is highly scenic. The area is adjacent to two proposed BLM wilderness areas. Because of the steep canyons, isolation, solitude, a primitive experience is achievable.

II. RESOURCE VALUES:

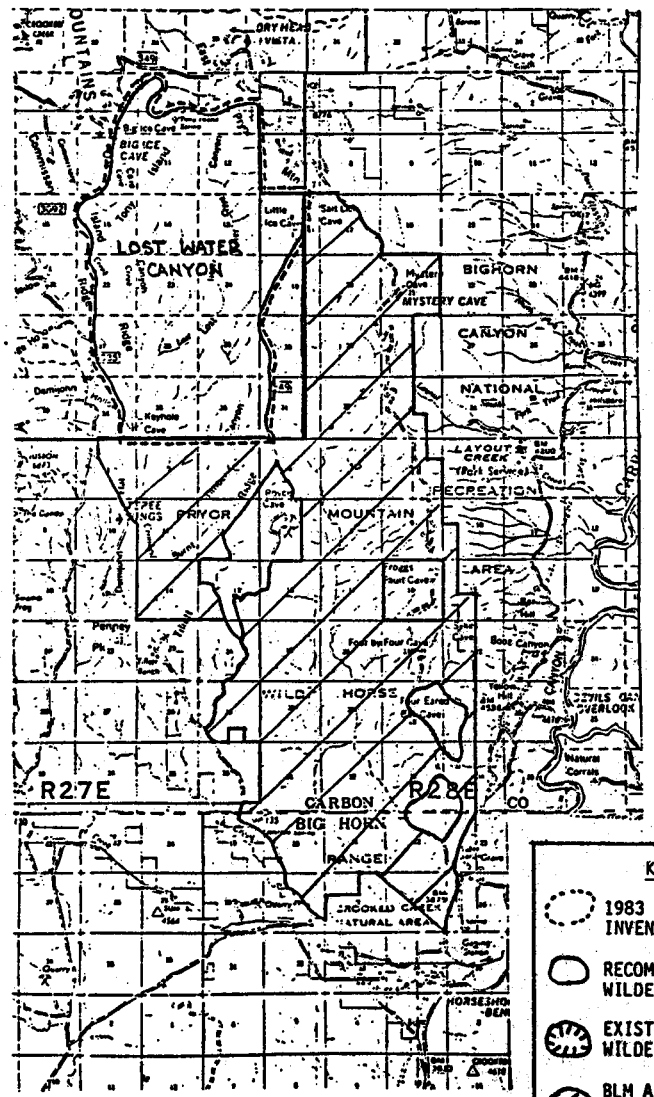
Allocation of this area to wilderness would have little effect on existing values or uses. Primitive recreational use is low, but the opportunity is high.

III. BOUNDARY RATIONALE:

The boundary has been expanded to include 1,280 adjacent acres on the east side. This segment, although separated from Lost Water Canyon by a road, is adjacent to and a logical addition to a proposed BLM Pryor Mountain wilderness to the east. Another BLM proposed wilderness, Burnt Timber Canyon is adjacent to Lost Water Canyon's along its southern boundary. Both BLM areas are recommended by BLM for wilderness and should be included in a Montana Wilderness Bill together with Lost Water Canyon. The three areas form one contiguous unit and should become a single wilderness area and be managed by one federal agency.

FFFFFF

K23p26


N
LOST WATER
CANYON
BIGHORN
CANYON
NATIONAL
RECREATION
AREA
PRYOR
MOUNTAIN
WILD
HORSE
R27E
R28E
CARBON
CO
BIG HORN
RANGE
KEY
1983 ROADLESS INVENTORY AREA
RECOMMENDED WILDERNESS AREA
EXISTING WILDERNESS AREA
BLM AREA RECOMMENDED WILDERNESS

K23p21

Appendix B

Montana Department of Fish, Wildlife and Parks

Comments on

Custer National Forest's

Proposed Land Allocations

There appears to be sufficient justification to make one fundamental change in management area (MA) designations along the Beartooth Face. All of the MA-G acreages should be incorporated into MA-D or MA-C. This is based both on the preferred plan analysis, and the Beartooth Face Planning Unit Final EIS dated October 10, 1978.

Areas along the Beartooth Face that are classified as MA-G in the forest plan (timber emphasis) are classified without exception as either marginal or special class areas in the Beartooth Face EIS. The Beartooth Face EIS defines marginal areas as "...productive forest lands where timber harvest may occur, but needs specially designated treatment because of excessive development costs, low productive values or resource protection constraints." Special class areas are defined as "...productive forest lands where timber utilization may occur, but needs specially designed treatment of the timber resource to achieve landscape, wildlife or other key resource objectives."

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K2328

MA-G areas do appear to be marginal when one analyzes the timber production values for these areas vs. timber cuts on MA-B areas (livestock-mineral emphasis) and MA-D areas (wildlife-timber emphasis).

Not only does MA-G produce less volume per acre than MA-B and MA-D, but it declines by 27% during the second decade, while MA-B and MA-D increase by 11 and 8%, respectively. Development costs will obviously be much higher if cutting is not also conducted on adjacent MA-B and MA-D areas, which leads to the conclusion that the timber harvest from these areas is being used primarily to justify cutting in MA-G. Inasmuch as many of the MA-D's contain winter range, which the just completed "Elk/logging Study" shows cannot be improved in any manner by timber cutting, it becomes even more apparent that the proposed timber cuts are not only likely to be highly uneconomic, but detrimental to wildlife as well. No mention is made of what "specially designed treatments" are to be incorporated into the cuts on special class areas as defined in the Beartooth Face Plan or what key resources will be protected. Where, therefore, is the analysis which shows these areas are no longer marginal or special class?

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According to the maps, a portion of the Stillwater bighorn winter range is contained in MA-C. It appears from the map that other foraging areas as well as most of the security areas fall in MA-E. We recommend that the entire Stillwater bighorn winter range be included in MA-C.

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K-23p29

The Silver Run elk winter range adjacent to Red Lodge is designated as MA-R and MA-T. These areas do not address the needs of wildlife. We recommend that the Silver Run elk winter range be classified as MA-C which will not detract from the area's ability to function as the municipal watershed for Red Lodge, nor detract from the esthetics of the Beartooth Highway. IIIIII

We revised the proposed action maps using the best and most recent wildlife data available. On the Ashland District we added D areas at the expense of B areas. This was based mainly on the complete 1985 winter flight of the district for mule deer winter distribution. Key turkey areas were also added.

On the Sioux District we added D areas at the expense of B and G areas. This was based on the complete winter deer distribution flights of 1977-78 and 78-79. Turkeys were also a main concern. The entire Long Pines is winter range for WT and MD. Redrawing of the D management area is composed of mostly WT yearlong and winter range. JJJJJJ

We also recommend re-classifying the Chalk Buttes as Management Area C or J. Even though it is now a D area we feel that C or J more closely fit this important raptor area. If the Chalk Buttes had more land area then D might well be an appropriate definition. But because of the small land area the preeminence of the raptors and their habitat can only be maintained with a landuse of minimal disturbance as described in Management Areas C or J.

K23p30

The suggested enlargement of the Management Area D areas have been prioritized with #1 as the highest and #5 as the lowest. Detailed justification for these suggested charges is available upon request. In general, the priorities were based upon the following:

#1 - sagebrush-grassland for wintering antelope and a strong probability of sagegrouse wintering and nesting. Strong chance of conflict with range sagebrush control.

#2 - excellent turkey habitat. Strong chance of conflict with logging.

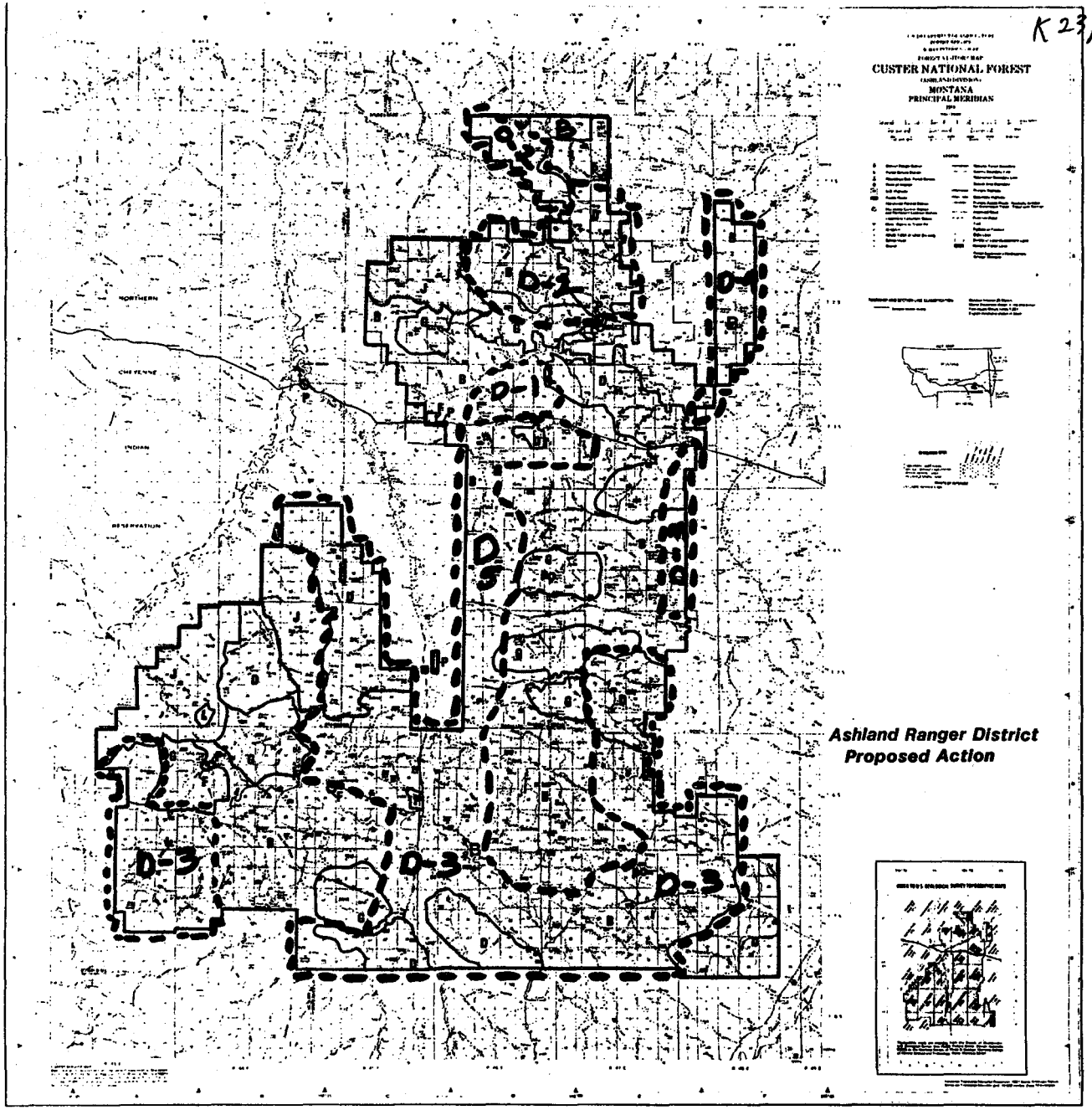
#3 - combination of turkey habitat, sharptail wintering areas and mule deer wintering. Moderate chance of conflict with timber and range.

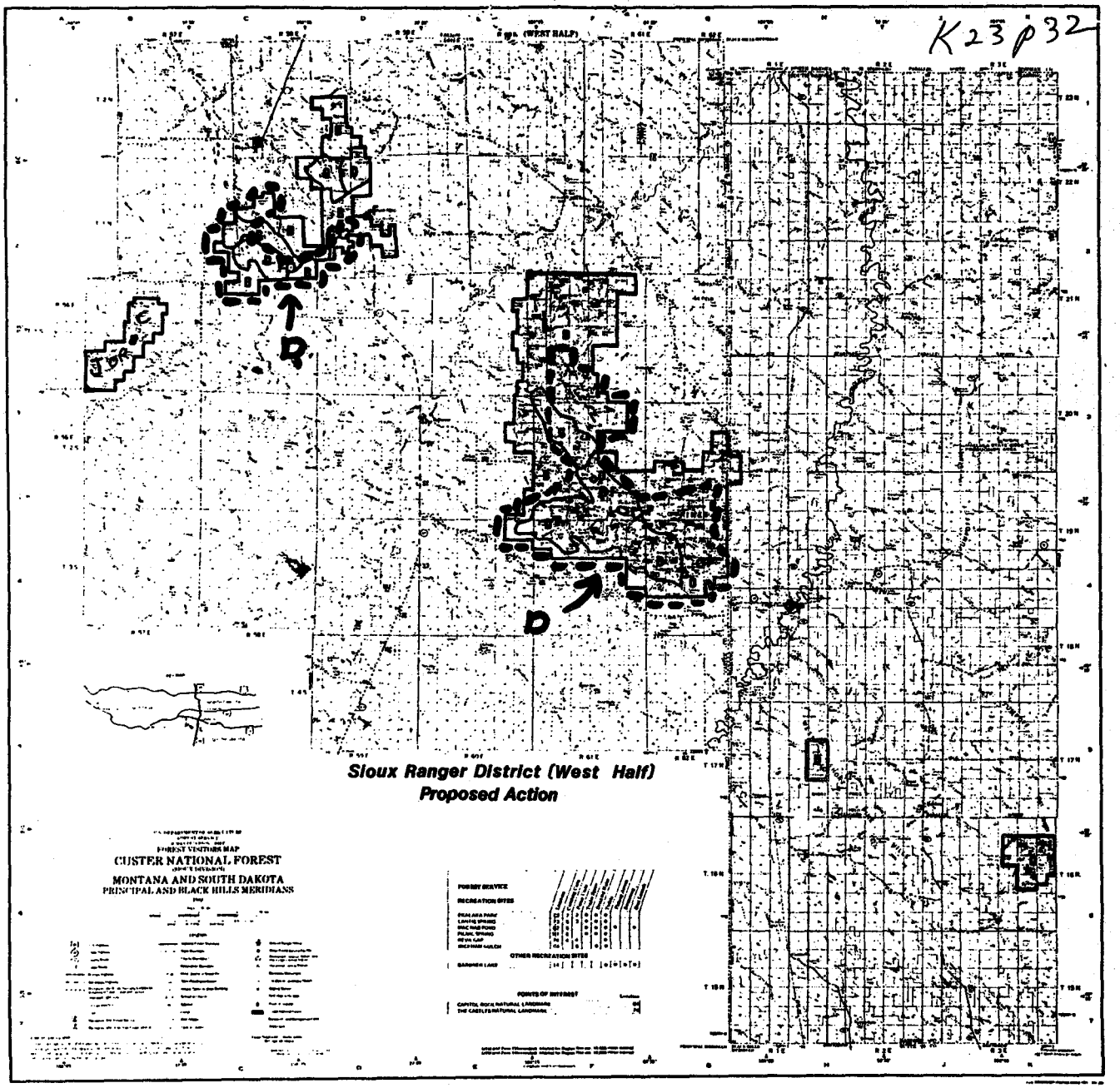
#4 & 5 - mule deer wintering. Moderate chance of conflict with range depending on future grazing plans and designs. Still important enough to be given wildlife emphasis.

JJJJJJ

012/7

K23/31


CUSTER NATIONAL FOREST
MONTANA
PRINCIPAL MERIDIAN
D-1
D-2
D-3
D-3
D-3
D-3
D-3
Ashland Ranger District
Proposed Action


K23p32
(WEST HALF)
D
D
Sioux Ranger District (West Half)
Proposed Action
FOREST VISITOR MAP
CUSTER NATIONAL FOREST
MONTANA AND SOUTH DAKOTA
PRINCIPAL AND BLACK HILLS MERIDIANS
FOREST SERVICE
RECREATION SITES
OTHER RECREATION SITES
POINTS OF INTEREST

CHAPTER VII
GLOSSARY

CHAPTER VII
GLOSSARY

ACCESS	See Public Access.
ACRE-EQUIVALENT	A unit of habitat output related to fish or wildlife habitat improvement projects. Acre equivalents are based on the number of acres of habitat that are influenced by one habitat acre actually modified by the habitat improvement project.
ACRE-FOOT	A measure of water or sediment volume equal to the amount which would cover an area of 1 acre to a depth of 1 foot (325,851 gallons or 43,560 cubic feet).
ACTIVITY	A measure, course of action, or treatment that is undertaken to directly or indirectly produce, enhance, or maintain forest and range land outputs or achieve administrative or environmental quality objectives.
ACTIVITY FUELS	Debris generated by a Forest activity that increases fire potential such a firewood gathering, pre-commercial thinning, timber harvesting, and road construction.
ACTIVITY TYPE	The further description of the actions, measures, or treatments within an activity.
ADMINISTRATIVE FACILITIES	Those facilities, such as Ranger Stations, work centers and cabins, which are used by the Forest Service in the management of the National Forest.
AFFECTED ENVIRONMENT	The biological and physical environment that will or may be changed by actions proposed and the relationship of people to that environment.
AFTERMATH	A new growth of grass after one or more mowings.
AIRSHED	Basic geographic units in which air quality is managed.
ALLOTMENT	See Range Allotment.
ALLOTMENT MANAGEMENT PLAN	The document that contains the action program needed to manage the range resource for livestock grazing with consideration given to soil, watershed, wildlife, recreation, timber,and other resources on lands within a range allotment or on a wild horse or burro territory. Allotment management plans, territory plans, and where appropriate, coordinated resource management plans identify prescriptions and practices for the management of grazing and browsing lands for livestock and wild horses and burros.
ALLOWABLE SALE QUANTITY	The quantity of timber that may be sold from the area of suitable land covered by the Forest Plan for a time period specified by the plan. This quantity is usually expressed on an annual basis as the "average annual allowable sale quantity".
ALTERNATIVE	A combination of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives. One of several policies, plans, or projects proposed for decision making. An alternative need not substitute for another in all respects.
ALTERNATIVE, NO ACTION	An alternative that maintains established trends or management direction.
AMENITY VALUES	Resource use for which market values (or proxy values) are not or cannot be established.
ANALYSIS AREA	One or more capability areas combined for the purpose of analysis in formulating alternatives and estimating various impacts and effects.
ANALYSIS OF THE MANAGEMENT SITUATION	A determination of the ability of the planning area to supply goods and services in response to society's demand for those goods and services.

ANALYSIS PERIOD, LONG TERM	A time horizon of expenditures in an analysis that is two or more 5-Year RPA planning periods in duration. RPA, program, Regional Guide, and Forest plan analysis have long-term periods.
ANALYSIS PERIOD, SHORT TERM	A time horizon of expenditures in an analysis that is only several years in duration. A budget analysis is short-term.
ANIMAL UNIT MONTH (AUM)	The quantity of forage required by the equivalent of a 1000 pound mature cow for one month.
ANNUAL FOREST PROGRAM	The summary or aggregation of all projects for a given year that, for a given level of funding, make up an integrated (multi-functional) course of action on a Forest planning area.
AQUATIC ECOSYSTEM	A stream channel, lake or estuary bed, the water itself, and the biotic communities that occur therein.
ARTERIAL ROADS	Roads comprising the basic access network for National Forest System administrative and management activities. These roads serve all resources to a substantial extent, and maintenance is not normally determined by the activities of any one resource. They provide service to large land areas and usually connect with public highways or other Forest arterial roads to form an integrated network of primary travel routes. The location and standards are often determined by a demand for maximum mobility and travel efficiency rather than by a specific resource management service. Usually they are developed and operated for long term land and resource management purposes and constant service.
ASSESSMENT	The Renewable Resource Assessment required by the Resource Planning Act.
ASSET, CAPITAL	A natural resource, manmade structure, facility, or improvement in natural resources used as an input in production processes.
ASSET, RESIDUAL	The remaining value of a capital asset at the end of the time horizon of the planning or analytical process.
AVAILABLE FOREST LAND	Land that has not been legislatively or administratively withdrawn from timber production by the Secretary of Agriculture or Forest Service Chief.
AUM	See Animal Unit Month.
AVERAGE ANNUAL CUT	The volume of timber harvested in a decade, divided by 10.
BASE SALE SCHEDULE	A timber sale schedule formulated on the basis that the quantity of timber planned for sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade and this planned sale and harvest is not greater than the long-term sustained yield capacity.
BENCHMARK	Reference points that define the bounds within which feasible management alternatives can be developed. Benchmarks may be defined by resource output or economic measures.
BENEFIT-COST RATIO	Measure of economic efficiency, computed by dividing total discounted primary benefits by total discounted economic costs.
BENEFIT, DIRECT	A primary benefit that fulfills specified objectives of the policy, program, or project.
BENEFIT, INDUCED	A primary benefit from an output that is incidental to the objectives of the policy, program, or project.
BENEFIT, PRIMARY	A benefit accruing to resource owners from a primary output, which may be direct or induced, or a residual asset. Primary benefits are components of net public benefits.
BENEFIT, SECONDARY	A benefit accruing to parties other than the resource owners, including effects on local, Regional, and national economies and on consumers of outputs. Secondary benefits are not necessarily included in net public benefits.
BENEFIT (VALUE)	Inclusive terms to quantify the results of a proposed activity project or program expressed in monetary or nonmonetary terms.

BEST MANAGEMENT PRACTICES (BMP)	The set of practices in the Forest Plan which, when applied during implementation of a project, ensures that water related beneficial uses are protected and that State water quality standards are met. BMP's can take several forms. Some are defined by State regulation or memoranda of understanding between the Forest Service and the States. Others are defined by the Forest interdisciplinary planning team for application Forest-wide. Both of these kinds of BMP's are included in the Forest Plan as Forest-wide Standards. A third kind are identified by the interdisciplinary team for application to specific management areas; these are included as Management Area Standards in the appropriate management areas. A fourth kind, project level BMP's, are based on site specific evaluation and represent the most effective and practicable means of accomplishing the water quality and other goals of the specific area involved in the project. These project level BMP's can either supplement or replace the Forest Plan standards for specific projects.
BIG GAME	Those species of large mammals normally managed as a sport hunting resource.
BIG GAME SUMMER RANGE	Land used by big game during the summer months.
BIG GAME WINTER RANGE	The area available to and used by big game through the winter season.
BIOLOGICAL EVALUATION	A review of all Forest Service planned, funded, executed or permitted programs and activities for possible effects on endangered, threatened, proposed or sensitive species. A biological evaluation may be used or modified to satisfy consultation requirements for biological assessment of construction projects requiring an environmental impact statement. (See FSM 2600)
BIOLOGICAL POTENTIAL	The maximum possible output of a given resource limited only by its inherent physical and biological characteristics.
BIOLOGICAL GROWTH POTENTIAL	The average net growth attainable in a fully stocked natural forest stand.
BOARD FOOT	A unit of measurement represented by a board one foot square and one inch thick.
BROADCAST BURN	Allowing a controlled fire to burn over a designated area within well-defined boundaries, for reduction of fuel hazard, as a silvicultural treatment, or both.
BOARD FOOT/CUBIC FOOT CONVERSION	The mathematical ratio of the board feet contained in one cubic foot of timber. This ratio varies with tree species, diameter height and form factors.
BROWSE	Twigs, leaves, and young shoots of trees and shrubs on which animals feed; in particular, those shrubs which are utilized by livestock and big game animals for food.
CANOPY	The more or less continuous cover of branches and foliage formed collectively by the crown of adjacent trees and other woody growth.
CAPABILITY	The potential of an area of land and or water to produce resources, supply goods and services, and allow resource uses under a specified set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils and geology, as well as the application of management practices, such as silviculture or protection from fires, insects, and disease.
CAPABILITY AREA	A geographic delineation used to describe characteristics of the land and resources in integrated Forest planning. Capability areas may be synonymous with ecological land units, ecosystems or land response units.
CAPITAL INVESTMENT	Investment in facilities such as roads and structures with specially-appropriated funds.

CARRYING CAPACITY	1 (recreation): the amount of recreation use an area can sustain without deterioration of site quality; 2 (wildlife): the maximum number of animals an area can support during a given period of the year; 3 (range): the maximum stocking rate possible without damaging the vegetation or related resources. Carrying capacity may vary from year to year on the same area due to fluctuating forage production.
CAVITY	A hollow in a tree that is used by birds or mammals for roosting and reproduction.
CEQ	See Council of Environmental Quality.
CFR	Code of Federal Regulations.
CHARGEABLE VOLUME	Chargeable volume is all volume that is included in the growth and yield projections for the selected management prescriptions used to arrive at the "allowable sale quantity," based on Regional utilization standards.
CLEARCUTTING	Harvesting of all trees in one cut. It prepares the area for a new, even-aged stand. The area harvested may be a patch, stand, or strip large enough to be mapped or recorded as separate age class in planning. Regeneration is obtained through natural seeding, or through planting or direct seeding.
CLIMAX PLANT COMMUNITY	The final or stable biotic community in a developmental series.
CLOSURE	The administrative order that does not allow specified uses in designated areas or on Forest development roads or trails.
CMAI	See Culmination of Mean Annual Increment.
COEFFICIENT (COST, VALUE, YIELD)	The numeric units used to include costs, values, and outputs in the analysis model used in the formulation of the Forest Plan.
COLLECTOR ROADS	Roads constructed to serve two or more elements but which do not fit into the other two road categories (arterial or local). Construction costs of these facilities are prorated to the respective element served. These roads serve smaller land areas and are usually connected to a Forest arterial or public highway. They collect traffic from local Forest roads or terminal facilities. The location and standard are influenced by both long term multi-resource service needs and travel efficiency. Forest collector roads are operated for constant or intermittent service, depending on land use and resource management objectives for the area served by the facility.
COMMERCIAL FOREST LAND (SUITABLE TIMBER LAND)	Land that is producing, or is capable of producing, crops of industrial wood and (1) has not been withdrawn from this classification by Congress, the Secretary of Agriculture or the Chief of the Forest Service; (2) where existing technology and knowledge is available to ensure timber production without irreversible damage to soils productivity or watershed conditions; and (3) where existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that adequate restocking can be obtained within years after final harvesting.
COMMERCIAL TIMBER SALES	The selling of timber from National Forest lands for the economic gain of the party removing and marketing the trees.
COMMODITIES	Resources with commercial value; all resource products which are articles of commerce, such as timber, range forage and minerals.
COMMON MATERIALS	See Minerals, Common Variety
COMMUNITY COHESION	The degree of unity and cooperation within a community in working toward shared goals and solutions to problems.
COMMUNITY STABILITY	The capacity of a community to absorb and cope with change without major hardship to institutions or groups within the community.
CONCERN	See Management Concern.
CONDITION CLASS	A descriptive category of the existing tree vegetation as it relates to size, stocking and age.

CONFINE	A fire suppression technique that restricts a fire within determined boundaries established either prior to the fire, during the fire, or in an escaped fire situation analysis.
CONGRESSIONALLY DESIGNATED AREAS	Areas established by Congressional legislation, such as National Wildernesses, National Wild and Scenic Rivers, and National Recreation Areas.
CONSERVATION PRACTICES	These are required land use practices on the National Grasslands that are imposed upon the persons or organizations holding grazing permits (including grazing agreements) in order to protect, improve, develop, and administer the land and thus assist in furthering the program of land conservation and good land utilization.
CONSTRAINT	A confinement or restriction on the range of permissible choices.
CONSUMPTIVE USES	Uses of a resource that reduce the supply. Examples of some consumptive uses of water are irrigation, domestic and industrial water use, grazing, and timber harvest.
CONTAIN	A fire suppression technique that surrounds a fire, and any spot fires therefrom, with control lines, as needed, which can reasonably be expected to check the fire's spread under prevailing and predicted conditions.
CORD	A unit of gross volume measurement for stacked roundwood based on external dimensions, generally implies a stack of four feet by four feet vertical cross section and eight feet long, contains 128 stacked cubic feet.
CORDUROY	A method of subgrade reinforcement often used on trails and for some roads whereby logs are placed perpendicular to the traveled way to support a surfacing material.
CORRIDOR (UTILITY CORRIDOR)	A linear strip of land which has ecological, technical, economic, social, or similar advantages over other areas for the present or future location of transportation or utility routes.
COST	The negative or adverse effects or expenditures resulting from an action. Costs may be monetary, social, physical or environmental in nature.
COST EFFICIENCY	The usefulness of specified inputs (costs) to produce specified outputs (benefits). In measuring cost efficiency, some outputs, including environmental, economic, or social impacts, are not assigned monetary values but are achieved at specific levels in the least cost manner. Cost efficiency is usually measured using present net value, although use of benefit-cost ratios and rates of return may be appropriate.
COST-SHARE	Refers to the process of cooperating in the joint development of a road system. The document executed through this process, called "Road Right-of-Way Construction and Use Agreement," specifies the terms of developing the transportation system for a specified land area.
COUNCIL ON ENVIRONMENTAL QUALITY	An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.
COVER/FORAGE RATIO	The ratio of tree cover (usually conifer types) to foraging areas (natural openings, clearcuts, etc.)
CRITICAL HABITAT	Specific areas within the geographical area occupied by the species on which are found those physical and biological features (1) essential to the conservation of the species and (2) which may require special management considerations or protection. Critical habitat shall not include the entire geographic area which can be occupied by the threatened and endangered species.
CUBIC FOOT	The amount of wood volume equivalent to a cube 1 foot by 1 foot by 1 foot.
CULMINATION OF MEAN ANNUAL INCREMENT (CMAI)	The point at which the volume increment for a tree or stand of trees has achieved it's highest mean value. Mean annual increment is based on expected growth according to the management intensities and utilization

	standards assumed in the Forest Plan. The CMAI is calculated by dividing the attained growth (volume) by it's corresponding age.
CULTURAL RESOURCES	The physical remains of human activity (artifacts, ruins, burial mounds, petroglyphs, etc.) and conceptual content or context (as a setting for legendary, historic, or prehistoric events, as a sacred area of native peoples, etc.) of an area of prehistoric or historic occupation.
CUTTING CYCLE	For a crop or stand, the planned interval of time between the beginning of one cutting period and the beginning of the succeeding cutting period.
DEMAND	The amount of output that users are willing to take at a specific price, time period, and conditions of sale.
DEMAND ANALYSIS	A study of the factors affecting the schedule of demand for a good or service, including the price-quantity relationship, if applicable.
DEPARTURE	A schedule which deviates from the principle of nondeclining flow by exhibiting a planned decrease in the timber sale and harvest schedule at any time in the future.
DEPENDENT COMMUNITIES	Communities whose social, economic, or political life would become discernibly different in important respects if market or non-market outputs from the National Forests were cut off.
DEVELOPED RECREATION	Recreation that occurs where improvements enhance recreation opportunities and accommodate intensive recreation activities in a defined area.
DEVELOPED RECREATION SITES	Relatively small, distinctly defined area where facilities are provided for concentrated public use, i.e., campgrounds, picnic areas and swimming areas.
DIAMETER BREAST HEIGHT (DBH)	The diameter of a tree measured 4½ feet above the ground.
DIRECTIONAL DRILLING	Drilling a well at an angle from outside an area, to tap oil or gas below the area.
DISCOUNT RATE	An interest rate that reflects the cost or time value of money. It is used in discounting future costs and benefits.
DISCOUNTING	An economic adjustment for the time value of money; mathematical reduction of costs and/or benefits which occur in the future to the present time for purposes of comparison.
DISPERSED RECREATION	That portion of outdoor recreation use which occurs outside of developed sites in the unroaded and roaded Forest environment i.e., hunting, backpacking and berry picking.
DISTRICT RANGER	The official responsible for administering the National Forest System Lands on a Ranger District.
DIVERSITY	The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.
ECOGROUP	Ecosystems grouped on the basis of capabilities for the type of land uses that occur.
ECONOMICS	The study of how limited resources, goods, and services are allocated among competing uses.
ECOSYSTEM	A complete, interacting system of organisms considered together with their environment (for example; a marsh, a watershed, or a lake.)
ECOTONE	A transition or junction zone between two or more diverse communities (ecosystems).
EDAPHIC	The influence of soils on living organisms, particularly plants, including man's use of the land for plant growth.
EFFECTIVE ACRES	Acres of nesting cover suitable for prairie grouse.

EFFECTS	Physical, biological, social and economic results (expected or experienced) resulting from achievement of outputs. Effects can be direct, indirect and cumulative.
EFFICIENCY, ECONOMIC	The usefulness of inputs (costs) to produce outputs (benefits) and effects when all costs and benefits that can be identified and valued are included in the computations. Economic efficiency is usually measured using present net value, though use of benefit-cost ratios and rates-of-return may sometimes be appropriate.
ELK HIDING COVER	Vegetation, primarily trees, capable of hiding 90 percent of an elk seen from a distance of 200 feet or less.
ELK SECURITY COVER (EFFECTIVE ELK SECURITY COVER)	Elk hiding cover modified by open roads. The greater the density of open roads within an area, the less effective is the hiding cover in providing security for elk.
ENDANGERED SPECIES	Any species, plant or animal, which is in danger of extinction throughout all or a significant portion of its' range. Endangered species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act.
ENDING INVENTORY CONSTRAINT (EIC)	Constraint to ensure that the total timber volume left at the end of the planning horizon will equal or exceed the volume that would occur in a managed Forest.
ENVIRONMENTAL ANALYSIS	An analysis of alternative actions and their predictable short and long-term environmental effects which include physical, biological, economic, social, and environmental design factors and their interactions.
ENVIRONMENTAL ASSESSMENT	A concise public document for which a Federal agency is responsible that serves to: (1) Briefly provide sufficient evidence and analysis for determining whether to prepare and environmental impact statement or a finding of no significant impact. (2) Aid an agency's compliance with the National Environmental Policy Act when no environmental impact statement is necessary. (3) Facilitate preparation of an environmental impact statement when one is necessary.
ENVIRONMENTAL IMPACT STATEMENT, DRAFT (DEIS)	A detailed written statement as required by Sec. 102(2)(C) of the National Environmental Policy Act.
ENVIRONMENTAL IMPACT STATEMENT FINAL (FEIS)	The final version of the public document required by NEPA. (see above)
EPHEMERAL STREAMS	Streams that flow only as a direct response to rainfall or snowmelt events. They have no baseflow.
EROSION	The group of processes whereby earthy or rocky material is worn away by natural sources such as wind, water or ice and removed from any part of the earth's surface.
ESSENTIALLY ROADLESS	Thirteen specific areas in North Dakota identified by the Rolling Prairie Unit Plan of 1975 and the Badlands Unit Plan of 1974. The essentially unroaded and open space of these areas were the characteristics that the special classifications intended to preserve.
EVEN-AGED MANAGEMENT	The application of a combination of actions that result in the creation of stands in which trees of essentially the same age grow together. Managed even-aged Forests are characterized by a distribution of the stands of varying ages (and, therefore, tree sizes) throughout the Forest area. The difference in ages between trees forming the main canopy level of the stand does not usually exceed 20 percent of the age of the stand at harvest rotation age. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Cutting methods include clearcutting, shelterwood cutting, and seed tree cutting.

EXTRACTIVE USE	Use of natural resources that removes them from their natural setting.
FAMILY UNIT	A camp or picnic spot with table, fireplace, tent pad, and parking spot.
FEE SITE	A Forest Service recreation area in which users must pay a fee. Fee sites must meet certain standards and provide certain facilities as specified in the Forest Service Manual.
FINAL CUT	Removal of the last seed bearers or shelter trees after regeneration is considered to be established under a shelterwood system.
FLOOD PLAIN	The lowland and relatively flat area adjoining inland waters, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.
FORAGE	All browse and nonwoody plants available to livestock or wildlife for feed.
FORB	Any herbaceous plant other than true grasses, sedges or rushes.
FOREST AND RANGELAND RENEWABLE RESOURCES PLANNING ACT OF 1974	An act of Congress which requires the assessment of the nation's renewable resources and the periodic development of a national renewable resources program. It also requires the development, maintenance and, as appropriate, revision of land and resource management plans for units of the National Forest System (e.g. National Forest and National Grasslands).
FOREST LAND	Land at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for non-forest use. Lands developed for non-forest use include areas for crops, improved pasture, residential, or administrative areas, improved constructed roads of any width, and adjoining road clearing and powerline clearing of any width. The term "occupied" when used to define forest land, will be measured by canopy cover of live forest trees at maturity. The minimum area for classification of forest land will be 1 acre or greater. Unimproved roads, trails, stream and clearings in forest areas are classified as forest if they are less than 120 feet in width.
FOREST LOCAL ROADS	Roads constructed and maintained for, and frequented by, the activities of a given resource element. Some uses may be made by other element activities, but normally maintenacne is not affected by such use. These roads connect terminal facilities with Forest collector or Forest arterial roads or public highways. The location and standard, usually are determined by the requirement of a specific resource activity rather than by travel efficiency. Forest local roads may be developed and operated for constant or intermittent service, depending on land use and resource management objectives for the area served by the facility.
FOREST SUPERVISOR	The official responsible for administering the National Forest System lands in a Forest Service Administrative unit, which may consist of one or more National Forests or National Grasslands.
FOREST SYSTEM ROAD	A road wholly or partly within or adjacent to and serving the National Forest System and which is necessary for the protection, administration and utilization of the National Forest System and the use and developments of it's resources.
FORPLAN	A linear programing system used for developing and analyzing Forest planning alternatives.
FOREST-WIDE MANAGEMENT GUIDELINES	An indication or outline of policy or conduct dealing with the basic management of the Forest. Forest-wide management guidelines apply to all areas of the Forest regardless of the other management prescriptions applied.
FSH	Forest Service Handbook.
FSM	Forest Service Manual.
FUEL BREAK	A zone in which fuel quantity has been reduced or altered to provide a position for suppression forces to make a stand against wildfire. Fuel breaks are

	designated or constructed before the outbreak of a fire. Fuel breaks may consist of one or a combination of the following: Natural barriers, constructed fuelbreaks, manmade barriers.
FUELS	Include both living plants; dead, woody vegetative materials; and other vegeatative materials which are capable of burning.
FUELS MANAGEMENT	Manipulation or reduction of fuels to meet Forest protection and management objectives while preserving and enhancing environmental quality.
FUELS TREATMENT	The rearrangement or disposal of natural or activity fuels to reduce the fire hazard.
FULL-SERVICE MANAGEMENT	The administration, operation and maintenance of developed recreation sites to established standards with the objective to provide a pleasant recreation experience for the visitor and exceed the minimum health and safety needs of the visitors.
GAME SPECIES	Any species of wildlife or fish for which seasons and bag limits have been prescribed, and which are normally harvested by hunters, trappers, and fisherman under State or Federal laws, codes, and regulations.
GOAL	A concise statement that describes a desired condition to be achieved. It is normally expressed in broad, general terms and is timeless in that it has no specific date by which it is to be completed. Goal statements form the principal basis from which objectives are developed.
GOODS AND SERVICES	The various outputs, including onsite uses, produced by forest and rangeland renewable resources.
GRAZING ALLOTMENT	See Range Allotment.
GROUP SELECTION CUTTING	A cutting method to develop and maintain uneven-aged stands by the removal of small groups of trees to meet a predetermined goal of size distribution and species composition in remaining stands.
GROWING STOCK LEVEL	A relative stand density measure used to guide a management objective such as maximizing timber volume yields or optimizing big game thermal cover.
GUIDELINE	See Standard and Guideline.
HABITAT TYPE	An aggregation of all land areas potentially capable of producing similar plant communities at climax.
HABITAT TYPE GROUP	A logical grouping of habitat types to facilitate resource planning and public presentations.
HIDING COVER	Trees of sufficient size and density to conceal animals from view at 300 feet.
IMPACT ANALYSIS AREA	The delineated area subject to significant economic and social impacts from Forest Service activities included in an economic or social impact analysis.
IMPROVEMENT CUTTING	Removing trees of undesirable species, form, or condition from the main canopy in stands past the sapling stage to improve the composition and quality.
INDICATOR SPECIES	Species identified in a planning process that are used to monitor the effects of planned management activities on viable populations of wildlife and fish including those that are socially or economically important.
INDIRECT EFFECTS	Secondary effects which occur in locations other than the initial action or significantly later in time.
INDIVIDUAL TREE SELECTION HARVEST	A cutting method to develop and maintain uneven-age stands by the removal of selected trees from specified age classes over the entire stand area in order to meet a predetermined goal of age distribution and species in the remaining stand.
INDUSTRIAL WOOD	All commercial roundwood products except fuelwood.
IN-MIGRATION	The movement of human population into an area.

INSTREAM FLOWS	The minimum water volume (cubic feet per second) in each stream necessary to meet seasonal streamflow requirements for maintaining aquatic ecosystems, visual quality, recreational opportunities and other uses.
INTEGRATED PEST MANAGEMENT	A process for selecting strategies to regulate forest pests in which all aspects of a pest-host system are studied and weighed. The information considered in selecting appropriate strategy includes the impact of the unregulated pest population on various resource values, alternative regulatory tactics and strategies, and benefit/cost estimates for these alternative strategies. Regulatory strategies are based on sound silvicultural practices and ecology of the pest-host system and consist of a combination of tactics such as timber stand improvement plus selective use of pesticides. A basic principle in the choice of strategy is that it be ecologically compatible or acceptable.
INTENSIVE GRAZING	Grazing management that controls distribution of cattle and duration of use on the range, usually by fences, so parts of the range are rested during the growing season.
INTERCHANGE	The interchange of land management responsibility between two Government Agencies.
INTERDISCIPLINARY TEAM (ID TEAM)	A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. Through interaction, participants bring different points of view to bear on the problem.
INTERMEDIATE HARVEST	Any removal of trees from a stand between the time of its formation and the regeneration cut. Most commonly applied intermediate cuttings are release, thinning, improvement, and salvage.
INTERMITTENT STREAM	A stream which flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow.
INTERPRETATIVE SERVICES	Visitor information services designed to inform and educate Forest visitors improving their understanding, appreciation and enjoyment of National Forest resources.
INVENTORY DATA	Recorded measurements, facts, evidence, or observations on Forest resources such as soil, water, timber, wildlife, range, geology, minerals, and recreation which was used to determine the capability and opportunity of the Forest to be managed for those resources.
ISSUE	See Public Issue.
JURISDICTION	The right, power or authority to administer or control. As an example, a County has jurisdiction on County Roads and may manage them as they desire.
"KEY REACHES" OF WATERSHED SYSTEM	A representative stream segment that can be expected to be sensitive to water resource changes and which adequately reflects the effects of management of the stream channel, the water, and their beneficial uses.
KEY SUMMER RANGE	An area that is potentially capable of supporting big game during the summer use period.
KEY WILDLIFE AREA	Any area which is critical to wildlife during at least a portion of the year. This importance may be due to vegetative characteristics such as residual nesting cover, or behavioral aspects of the animals such as lambing areas. Key areas include: winter ranges, lambing/fawning/calving areas, dancing/strutting grounds, nesting areas, breeding grounds, elk wallows, riparian and woody draws, and roosting areas.
KEY WINTER RANGE	The portion of the yearlong range where big game find food and/or cover during severe winter weather.
LAND EXCHANGE	The conveyance of non-Federal Land or interests to the United States in exchange for National Forest System land or interests in land.
LANDLINE LOCATION	The legal identification, accurate location, and description of property boundaries.

LANDTYPE	An inventory map unit with relatively uniform potential for a defined set of land uses. Properties of soils, landform, natural vegetation and bedrock are commonly components of landtype delineation used to evaluate potentials and limitations for land use.
LANDTYPE GROUP	A logical grouping of landtypes that facilitate resource planning.
LEASABLE MINERALS	See Minerals, Leasable.
LEVEL I FIRE ANALYSIS	General fire management analysis to provide historical information that assists the interdisciplinary team in the analysis of the management situation and formulation of alternatives for the Forest Plan.
LEVEL II FIRE ANALYSIS	An analytical process which guides the implementation of fire management activities of the Forest Plan.
LINEAR PROGRAMMING	A mathematical method used to determine the optimal distribution of limited resources between competing demands when both the objective (e.g., profit or cost) and the restrictions on its attainment are expressible as a system of linear equalities or inequalities (e.g., y=a+bx).
LIMITED SURFACE USE STIPULATION	A mineral lease clause, which, if attached to a mineral lease, prohibits surface disturbing activities on the lease pending submission of a surface use and operations plan which is satisfactory to the BLM and the surface management agency for protection of special existing or planned uses. This stipulation may, when site-specific operations are proposed and analyzed, be modified if other less stringent mitigation is determined to be sufficient to protect the other resources.
LOCAL DEPENDENT INDUSTRIES	Local industries relying on National Forest outputs for economic activity.
LOCAL ROUTES	Local roads branch off the collector roads and are normally for a single use. They generally are dead end roads and maybe closed or obliterated when no longer needed by the single use.
LOCATABLE MINERALS	See Minerals locatable.
LOESS	A uniform and unstratified fine sand or silt transported by wind.
LONG-TERM SUSTAINED YIELD CAPACITY (LTSY)	The highest uniform wood yield from lands being managed for timber production that may be sustained under a specified intensity of management consistent with multiple use objectives.
M	Thousand
MM	Million
MAUM	Thousand Animal Unit Months.
MBF	Thousand Board Feet
MMBF	Million Board feet
MMCF	Million Cubic feet
MANAGEMENT ACTION	Any activity undertaken as part of the administration of the Forest.
MANAGEMENT AREA	An aggregation of capability areas which have common management direction and may be noncontiguous in the Forest. Consists of a grouping of capability areas selected through evaluation procedures and used to locate decisions and resolve issues and concerns.
MANAGEMENT CONCERN	An issue, problem, or a condition which constrains the range of management practices identified by the Forest Service in the planning process.
MANAGEMENT DIRECTION	A statement of multiple-use and other goals and objectives, the associated management prescriptions, and standards and guidelines for attaining them.
MANAGEMENT EFFECTS	Physical, biological, social and economic responses to management practices.

MANAGEMENT EMPHASIS	A management practice or combination of management practices designed to stress production of a particular type of output or mix of outputs.
MANAGEMENT INTENSITY	A management practice or combination of management practices and associated costs designed to obtain different levels of goods and services.
MANAGEMENT OPPORTUNITY	A statement of general actions, measures, or treatments that address a public issue or management concern.
MANAGEMENT PRACTICE	A specific activity, measure, course of action, or treatment. Proposed management practices are those scheduled in the first decade of Forest Plan implementation. Probable management practices are those scheduled in the second decade of Forest Plan implementation.
MANAGEMENT PRESCRIPTION	Management practices and intensities selected and scheduled for application on a specific area to attain multiple use and other goals and objectives.
MANAGEMENT SITUATION-I	Situation I is defined as areas that "contain grizzly population centers and components needed for survival and recovery of the species".
MANAGEMENT SITUATION-II	Areas that lack distinct grizzly bear population centers and highly suitable habitat does not generally occur, although some habitat components exist and grizzly bears may be present on occasions.
MANAGEMENT SITUATION-III	Grizzly presence is possible but infrequent. Developments such as campgrounds, resorts or other high human use associated facilities make grizzly bear presence untenable for humans and/or grizzlies.
MANAGEMENT STANDARDS AND GUIDELINES	See Standard and Guideline.
MARKET VALUE	The unit price of an output normally exchanged in a market after at least one stage of production, expressed in terms of what people are willing to pay as evidenced by market transactions.
MATURE TIMBER	Individual trees or stands of trees that in general are at their maximum rate in terms of the physiological processes expressed as height, diameter, and volume growth.
MAXIMUM RESOURCE POTENTIAL	The maximum possible output of a given resource limited only by its inherent physical and biological characteristics.
MEAN ANNUAL INCREMENT	The total volume increase in a tree or stand of trees up to a given age, divided by that age.
MINERAL ENTRY	The filing of a mining claim on Federal land to obtain the right to mine any locatable minerals it may contain. Also the filing for a mill site on Federal land for the purpose of processing off-site locatable minerals.
MINERAL WITHDRAWAL	A formal designation by the Secretary of Interior which precludes entry or disposal of mineral commodities under the mining and/or mineral leasing laws.
MINERAL EXPLORATION	The search for valuable minerals.
MINERAL PRODUCTION	The extraction of mineral deposits.
MINERALS, COMMON VARIETY	Deposits of sand, stone, gravel, etc. of widespread occurrence and not having distinct or special value. These deposits are used generally for construction and decorative purposes and are disposed of under the Materials Act of 1947.
MINERALS, LEASABLE	Those minerals which are disposed of under authority of the various mineral leasing acts. Minerals include coal, oil, gas, phosphate, sodium, potassium, oil shale,sulfur (in Louisiana and New Mexico), and geothermal steam. On acquired lands, all minerals are leasable except those classified as common variety.

MINERALS, LOCATABLE	Those minerals on Public Domain lands which are disposed of under the general mining laws. Included are minerals such as gold, silver, lead, zinc and copper which are not classed as leasable or salable.
MINIMUM MANAGEMENT REQUIREMENTS	Standards for resource protection, vegetative manipulation, silviculturist practices, even-aged management, riparian areas, soil and water and diversity, to be met in accomplishing National Forest System goals and objectives (see 36 CFR 219.27).
MINIMUM RESOURCE STANDARDS	Specific conditions of individual resources which must be maintained in order to meet minimum management requirements (36 CFR 219.27) and/or other legal requirements.
MINERAL RIGHTS	*Mineral Rights outstanding* are third party rights, an interest in minerals not owned by the person or party conveying the land to the United States. It is an exception in the deed which is the result of a prior conveyance seperating title of certain minerals from the surface estate. *Reserved Mineral Rights* are the retention of ownership of all or part of the mineral rights by a person or party conveying land to the United States. Conditions for the exercising of these rights have been defined in the Secretary's "Rules and Regulations to Govern Exercising of Mineral Rights Reserved in Conveyances to the United States" attached to and made a part of deeds reserving mineral rights.
MINIMUM VIABLE	See Viable Population.
MINING CLAIMS	A geographic area of the public lands held under the general mining laws in which the right of exclusive possession is vested in the locator of a valuable mineral deposit. Includes lode claims, placer claims, mill sites and tunnel sites.
MITIGATE	To lessen the severity.
MITIGATION	Avoiding or minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact by preservation and maintenance operations during the life of the action.
MODIFICATION (VQO)	See Visual Quality Objective (VQO).
MONITORING AND EVALUATION	The periodic evaluation on a sample basis of Forest Plan management practices to determine how well objectives have been met and how closely management standards have been applied.
MOUNTAIN PINE BEETLE	A species of Bark Beetle that spends the major portion of their life cycle in a tree's cambium layer. Through a combination of the insect feeding on the cambium layer and the introduction of fungi which stop the resin flow, the tree is girdled and killed.
MULTIPLE USE	The management of all the various renewable surface resources of the National Forest System so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some lands will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.
NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)	An act which encourages productive and enjoyable harmony between man and his environment; promotes efforts to prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; enriches the understanding of the ecological systems and natural resources important to the Nation; and establishes a Council on Environmental Quality.

NATIONAL FOREST LANDSCAPE MANAGEMENT SYSTEM	The planning and design of the visual aspects of multiple use land management in such ways that the visual effects maintain or upgrade man's psychological welfare.
NATIONAL FOREST MANAGEMENT ACT (NFMA)	A law passed in 1976 as amendments to the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of Regional and Forest plans and the preparation of regulations to guide that development.
NATIONAL FOREST SYSTEM	All national forest lands reserved or withdrawn from the public domain of the United States, all national forest lands acquired through purchase, exchange, donation, or other means, the national grasslands and land utilization projects administered under Title III.
NATIONAL RECREATION TRAILS	Trails designated by the Secretary of the Interior or the Secretary of Agriculture as part of the national system of trails authorized by the National Trails System Act. National recreation trails provide a variety of outdoor recreation uses.
NATIONAL REGISTER OF HISTORIC PLACES	A listing maintained by the National Park Service of areas which have been designated as being of historical significance. The Register includes places of local and State significance as well as those of value to the Nation as a whole.
NATIONAL WILD AND SCENIC RIVER SYSTEM	Rivers with outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values designated by Congress under the Wild and Scenic Rivers Act for preservation of their free-flowing condition.
NATIONAL WILDERNESS PRESERVATION SYSTEM	All lands covered by the Wilderness Act and subsequent wilderness designations, irrespective of the department or agency having jurisdiction.
NATURAL BARRIER	A natural feature that will restrict livestock movements such as a dense stand of trees or downfall; or a feature that will stop the spread of fire such as a talus slope, water course, or areas otherwise devoid of fuel.
NEPA	See National Environmental Policy Act.
NET PUBLIC BENEFITS	An expression used to signify the overall long-term value to the Nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued or not. Net public benefits are measured by both quantitative and qualitative criteria rather than a single measure or index. The maximization of net public benefits to be derived from management of units of the National Forest System is consistent with the principles of multiple use and sustained yield.
NFMA	See National Forest Management Act.
NO ACTION ALTERNATIVE	The management direction, activities, outputs, and effects that are likely to exist in the future if the current plan would continue unchanged.
NONCHARGEABLE VOLUME	All volume that is not included in the growth and yield projections for the selected management prescriptions used to arrive at the allowable sale quantity. It also includes all volume removed from nonsuitable lands.
NONCOMMODITY OUTPUTS	See Output, Nonmarket.
NONCONSUMPTIVE USE	Those uses of resources that do not reduce the supply. Nonconsumptive uses of water include hydroelectric power generation, boating, swimming, etc.
NONDECLINING FLOW	The principle that the quantity of timber planned for sale or harvest for any future decade must be equal to or greater than the planned sale and harvest for the preceding decade, and this planned sale and harvest for any decade is not greater than the long-term sustained yield capacity.
NONDECLINING YIELD	See Nondeclining Flow.
NONEXTRACTIVE USE	Use which does not remove a resource from its natural setting.

NONGAME	Species of animals which are not managed as a sport hunting resource.
NONPOINT SOURCE POLLUTION	Sources from which the pollutants discharged are: (1) induced by natural processes, including precipitation, seepage, percolation, and runoff; (2) not traceable to any discrete or identifiable facility and (3) better controlled through the utilization of Best Management Practices, including process and planning techniques. This includes natural pollution sources not directly or indirectly caused by man.
NONSTOCKED	A stand of trees or aggregation of stands that have a stocking level below the minimum specified for meeting the prescribed management objectives.
NO-SURFACE OCCUPANCY STIPULATION	A mineral lease clause which, if attached to a mineral lease, prohibits the lessee from constructing well pads or otherwise occupying the land surface unless, upon site-specific review, it is determined by the authorized officer that the requirements of the stipulation can be modified if other less stringent mitigation is determined to be sufficient to protect the other resources.
OBJECTIVE	A concise time-specific statement of measurable planned results that respond to preestablished goals. An objective forms the basis for further planning, to define the precise steps to be taken and the resources to be used in achieving identified goals.
OBJECTIVE FUNCTION	A term used in linear programming describing the criteria to be optimized. Examples of objective functions are: maximize present net value, minimize cost or maximize timber.
OFF-ROAD VEHICLE	Any vehicle capable of being operated off an established road or trail, e.g., motorbikes, four-wheel drives, and snowmobiles.
OFFSET DRILLING	To drill a well adjacent to a previously drilled well, usually in the adjacent spacing unit.
OLD GROWTH TIMBER	See Overmature Timber.
OPPORTUNITY COST	An opportunity cost is value foregone. In this analysis it is a cost calculated as the difference between present net value of the alternative and the present net value of the maximum PNV increment.
OPTIMUM	The greatest level of production that is consistent with other resource requirements as constrained by environmental, social and economically sound conditions.
OUTPOST WELL	An outpost well is a well drilled a distance from a production well than a step-out but still on the same structural trend. (Distance could be a couple of miles.)
OUTPUT	A good, service, or on-site use that is produced from forest and rangeland resources. Definitions of Forest and rangeland output definitions, codes and units measure are contained in the Management Information Handbook (FSH 1309.11). Examples are: X06-Softwood Sawtimber Production — MBF; X80-Increased Water Yield — Acre Feet; W01-Primitive Recreation Use — RVD's.
OUTPUT, CONTROLLED	The amount of an output which management has the legal and practical ability to control with management activities.
OUTPUT, DIRECT	An output that fulfills specified objectives of the policy, program, or project being evaluated.
OUTPUT, INDUCED	A good, service, or on-site use which is incidental to the objectives of the resource activity. An example is the timber harvest activity which produces a primary output of board feet of timber and an induced output of acres of improved wildlife habitat because of the harvest activity.
OUTPUT, MARKET	A good, service, or on-site use that can be purchased at a price.
OUTPUT, NON-CONTROLLED	The amount of an output which will occur regardless of management activity.

OUTPUT, NONMARKET	A good, service, or on-site use not normally exchanged in a market.
OUTPUT, PRIMARY	A good, service, or on-site use that results from the completion of an activity, project or program that meets the specific objectives of the resource. Examples are board feet of timber, recreation visitor days, etc.
OVER-THE-COUNTER SALE	The selling of Forest products without bidding, as requested by the general public, usually for products such as fuelwood, corral poles, ornamental shrubs, etc.
OVERMATURE TIMBER	Individual trees or stands of trees that in general are past their maximum rate in terms of the physiological processes expressed as height, diameter and volume growth.
OVERSTORY	That uppermost canopy of the forest when there is more than one level of vegetation.
OVERTHRUST BELT	A complex geologic feature, extending from Alaska to Mexico, which resulted from compressional stresses within the earth, and which is characterized by abundant thrust faults. This zone passes through and includes all of western Montana.
PARTIAL RETENTION (VQO)	See Visual Quality Objective (VQO).
PARTICULATES	Small particles suspended in the air and generally considered pollutants.
PATENTED MINING CLAIMS	A patent is a document which conveys title to land. When patented, a mining claim becomes private property and is land over which the United States has no property rights, except as may be reserved in the patent. After a mining claim is patented, the owner does not have to comply with requirements of the General Mining Law of 1872 or implementing regulations. But must still comply with State regulations.
PERENNIAL STREAMS	Streams that flow continuously throughout most years.
PAYMENT IN LIEU OF TAXES	Payments to local or State governments based on ownership of Federal land and not directly dependent on production of outputs or receipt sharing. Specifically, they include payments made under the Payments in Lieu of Taxes Act of 1976 by the U.S. Department of the Interior.
PERMITTED GRAZING	Use of a National Forest range allotment under the terms of a grazing permit.
PERSON YEAR (WORK YEAR)	A person year equals 2,087 hours of work time. A person year may be one person working yearlong or several persons filling seasonal positions.
PLAN OF OPERATIONS	A written plan describing mining and mineral processing activities that will likely cause a significant surface disturbance. The plan is prepared by those engaged in activities, such as prospecting, exploration or mining, in the National Forest. This plan must be approved by a Forest Officer.
PLANNED IGNITIONS	A fire started by a deliberate management action under an approved plan to meet specific resource objectives.
PLANNING AREA	The area of the National Forest System covered by a Regional or Forest Plan.
PLANNING CRITERIA	Standards, tests, rules, and guidelines by which the planning process is conducted and upon which judgments and decisions are based.
PLANNING HORIZON	The overall time period considered in the planning process that spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions which would influence the planning decisions. In the National Forest planning process, this is 150 years.
PLANNING PERIOD	A time interval for which inputs and outputs are identified in a planning process. Current RPA and National Forest Plan intervals are 5 and 10 years, respectively.

PLANNING RECORDS	Documents and files that contain detailed information and decisions made in developing the Forest Plan. Available at the Forest Supervisor's Office.
PNV	See Present Net Value.
POLETIMBER TREES	Live trees of commercial species at least five inches in diameter at breast height but smaller than sawtimber size, and of good form and vigor.
POLICY	A guiding principle upon which is based a specific decision or set of decisions.
POTENTIALLY (TENTATIVELY) SUITABLE LAND	Forest land (as defined in CFR 219.3) for which technology is available that ensures timber production without irreversible resource damage to soils, productivity, or watershed conditions; for which there is reasonable assurance that such lands can be restocked (CFR 219.14); and which is available for timber management.
PRACTICE	See Management Practice.
PRECOMMERCIAL THINNING	The selective felling, deadening, or removal of trees in a young stand primarily to accelerate diameter increment on the remaining stems, maintain a specific stocking or stand density range, and improve the vigor and quality of the trees that remain.
PREDATOR	One that preys, destroys, or devours — usually an animal that lives by preying on other animals.
PREHISTORIC SITE	Archeologic sites associated with American Indians and usually occuring before contact with Europeans.
PREPARATORY CUT	Removal of trees near the end of a rotation so as to permanently open the canopy and enlarge the crowns of seed bearers, with a view to improving conditions for seed production and natural generation, as typically in shelterwood systems.
PRESCRIBED BURNING	The intentional application of fire to wildland fuels in either their natural or modified state under such conditions as allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to further certain planned objectives (i.e., silviculture, wildlife management, etc.).
PRESCRIBED FIRE	A fire burning under specified conditions which will accomplish planned objectives in strict compliance with an approved plan and the conditions under which the burning takes place and the expected results are specific, predictable, and measurable.
PRESCRIPTION	See Management Prescription.
PRESENT NET VALUE (PNV)	The difference between the discounted value (benefits) of all outputs to which monetary value or established market prices are assigned and the total discounted costs of managing the planning area.
PRESENT NET WORTH	The discounted value of price times quantity less cost.
PRESERVATION (VQO)	See Visual Quality Objectives (VQO).
PRESUPPRESSION	Activities required in advance of fire occurrence to ensure effective suppression action. Includes (1) recruiting and training fire forces; (2) planning and organizing attack methods; (3) procuring and maintaining fire equipment; and (4) maintaining structural improvements necessary for the fire program.
PREVENTION OF SIGNIFICANT DETERIORATION OF AIR QUALITY (PSD)	A classification established to preserve, protect, and enhance the air quality in National Wilderness Preservation System areas in existence prior to August 1977 and other areas of National significance, while ensuring economic growth can occur in a manner consistent with the preservation of existing clean air resources. Specific emission limitations and other measures, by class, are detailed in the Clean Air Act (42 U.S.C. 1875 et 15q.).
PRICED OUTPUTS	Resource outputs that have market or assigned dollar values.

PRIMARY RANGE	Areas which animals prefer to use and over which they will graze when management is limited. The area on which overuse will occur before secondary range is used when animals are allowed to shift for themselves.
PRIMITIVE RECREATION SETTING	A classification of the recreation opportunity spectrum that characterizes an essentially unmodified natural environment of a size or remoteness that provide significant opportunity for isolation from the signs and sounds of man and a feeling of vastness of scale. Visitors have opportunity to be part of the natural environment, encounter a high degree of challenge and use a maximum of outdoor skills but have minimum opportunity for social interaction.
PRIMITIVE ROADS	Roads that came into existence with little regard for grade or drainage control, or were abandoned facilities from some prior use. They are sometimes created merely by repeated driving over an area. Such roads are rarely, if ever, maintained and then only by users. These roads are single lane, usually with native surfacing, and sometimes passable with four-wheel drive vehicles only, especially in wet weather.
PRIMITIVE SETTING	A large area (generally at least 5,000 acres) at least three miles from all roads, railroads or trails with motorized use. The area is essentially a natural environment unmodified by man.
PRODUCTION POTENTIAL	The capability of the land or water to produce life-sustaining features (forage, cover, aquatics).
PRODUCTIVITY	See Site Productivity.
PROGRAM DEVELOPMENT AND BUDGETING	The process by which activities for the Forest are proposed and funded.
PROPOSED ACTION	In terms of the National Environmental Policy Act, the project, activity, or action that a Federal agency intends to implement or undertake and which is the subject of an environmental analysis.
PRUNING	The removal of live or dead branches from standing trees.
PUBLIC ACCESS	Usually refers to a road or trail route over which a public agency claims a right-of-way available for public use.
PUBLIC INVOLVEMENT	A Forest Service process designed to broaden the information base upon which agency decisions are made by (1) Informing the public about Forest Service activities, plans, and decisions, and (2) Encouraging public understanding about and participation in the planning processes which lead to final decision making.
PUBLIC ISSUE	A subject or question of widespread public interest identified through public participation relating to management of National Forest System lands.
RANGE ALLOTMENT	A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System and associated lands administered by the Forest Service.
RANGE BETTERMENT FUNDS	Funds established by Title IV, section 401 (b)(1), of the Federal Land Policy and Management Act of 1976 to be used for ranage improvement. This consists of 50 percent of all money received by the United States as fees for grazing livestock on the National Forests in the 16 contiguous western States.
RANGE PRIMARY	See Primary Range.
RANGE SECONDARY	See Secondary Range.
RANGE, TRANSITORY	See Transitory Range.
RANGE IMPROVEMENT, NONSTRUCTURAL	Any practice designed to improve range condition or facilitate more efficient utilization of the range.

RANGE IMPROVEMENT, STRUCTURAL	Any structure or excavation to facilitate management of range or livestock.
RANGELAND	Land on which the climax vegetation (potential natural plant community) is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing and browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundra, and certain forb and shrub communities. It also includes areas seeded to native or adapted introduced species that are managed like native vegetation.
RANGER DISTRICT	Administrative subdivision of the Forest supervised by a District Ranger.
RARE II	See Roadless Area Review and Evaluation II.
REAL DOLLAR	A monetary value that compensates for inflation.
RECEIPTS	Money collected from timber stumpage, livestock grazing, campgrounds, special use permits, and oil and gas lease rentals and royalties, and returned to the federal treasury.
RECORD OF DECISION	A document separate from but associated with an environmental impact statement that publicly and officially discloses the responsible official's decision on the proposed action.
RECREATION CAPACITY	The number of people that can take advantage of a recreation opportunity at any one time without substantially diminishing the quality of the experience sought after.
RECREATION EXPERIENCE LEVEL	A concept used in recreation management to delineate the range of opportunities for satisfying basic recreation needs of people. A scale of five experience levels ranging from "primitive" to "highly developed" is planned for the National Forest System.
RECREATION INFORMATION MANAGEMENT (RIM)	The Forest Service system for recording recreation facility condition and use.
RECREATION LIVESTOCK USE	The use of an area by animals, such as horses and mules, which are used primarily in conjunction with recreation activities.
RECREATION OPPORTUNITIES	The combination of recreation settings, activities, and experiences provided by the Forest.
RECREATION OPPORTUNITY GUIDE	A catalogue describing the recreation activities available on a particular Ranger District.
RECREATION OPPORTUNITY SPECTRUM (ROS)	A system for planning and managing recreation resources that recognizes recreation activity opportunities, recreation settings, and recreation experiences along a spectrum or continuum.
RECREATION PREFERENCE TYPE (RPT)	A term used to indicate the types of recreation experiences sought after by Forest users. They are overlapping portions of the total recreation preferences spectrum that the public may express demands for. RPT I. Orientations toward using natural, unmodified environment for the appreciation and understanding of natural phenomena; as a source of intellectual and/or physical challenges; for seeking solitude; and for esthetic stimulations. RPT II. Orientations toward using natural or semiprimitive environment in searching for and extraction of indigenous fish and/or game species, rocks, minerals, edible plants, etc., and for enjoyment of the physical surroundings in which such extractable objects are found. RPT III. Orientations toward using semiprimitive, lightly developed areas for relaxing in natural surroundings; as a source of tranquility and freedom from tension; and for esthetic stimulation.

	RPT IV. Orientation toward using moderately developed areas and surrounding environment for intentional social interaction and group learning experiences.
	RPT V. Orientations toward using highly developed areas for social interactions with many other people and for pursuits which allow for the expression of learned physical abilities.
RECREATION RESIDENCE	A house or cabin on National Forest land for seasonal recreational use that is not the primary residence of the owner.
RECREATION TYPES	*Developed Recreation* — The type of recreation that occurs where modifications (improvements) enhance recreation opportunities and accommodate intensive recreation activities in a defined area.
	Dispersed Recreation — That type of recreation use related to and in conjunction with roads and trails that requires few if any improvements and may occur over a wide area. Activities tend to be day-use oriented and include hunting, fishing, berrypicking, off-road vehicle use, hiking, horseback riding, picniking, camping, viewing scenery, snowmobiling, and many others.
RECREATION VISITOR DAY (RVD)	One visitor day equals 12 hours (one person for 12 hours, or 12 people for 1 hour, or any combination thereof).
REDUCED SERVICE MANAGEMENT	The administration, operation and maintenance of developed recreation sites to established standards with the objective to meet minimum health and safety needs of the visitor and keep the site open to public use.
REFORESTATION	The renewal of forest cover by seeding, planting, and natural means.
REGENERATION	The renewal of a tree crop, whether by natural or artificial means. This term may also refer to the crop itself.
REGIONAL FORESTER	The official responsible for administering a single Region of the Forest Service.
REGIONAL GUIDE	A document developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, that guides all natural resource management activities and established management standards and guidelines for National Forest System lands of a given Region to the Forests within a given Region. It also disaggregates the RPA objectives assigned to the Region to the Forests within that Region.
REGULATED	The commercial forest land that is organized for timber production under the principle of sustained yield. The harvest of timber from this land is regulated to achieve multiple long range objectives, such as maintaining setting for recreational activities, rotating forage production areas and wildlife habitat, increasing water production yield, and increasing the growth and utilization of timber for the Nation's supply.
REGULATIONS	Refers to the Code of Federal Regulations for implementing the National Forest Management Act, 36 CFR, Part 219.
RENEWABLE RESOURCES	Resources that are possible to use indefinitely, when the use rate does not exceed the ability to renew the supply. However, in the RPA program, the term is used to describe those matters within the scope of responsibilities and authorities of the Forest Service as required by the Forest and Rangeland Renewable Resouces Planning Act of 1974. Consequently, the renewable resources include: timber, range, minerals, wildlife and fish, water, recreation, and wilderness.
RENEWABLE RESOURCES ASSESSMENT	An appraisal of the Nation's renewable resources that recognizes their vital importance and the necessity for long-term planning and associated program development. The Assessment meets the requirements of Section 3 of the Forest and Rangeland Renewable Resources Planning Act and includes analysis of present and anticipated uses, demands, and supplies of the renewable resources; a description of Forest Service programs and responsibilities; and a discussion of policy considerations, laws, and regulations.

RENEWABLE RESOURCES PROGRAM	The program for management and administration of the National Forest Service System, for Research, for Cooperative State and Private Forest Service programs, and for conduct of other Forest Service activities in accordance with Section 4 of the Forest and Rangeland Renewable Resources Planning Act.
RESOURCE ALLOCATION MODEL	A mathematical model using linear programming which will assign prescriptions to land areas and schedule implementation of those prescriptions simultaneously. The end purpose of the model is to find a schedule and prescription assignment that meets the goals of the Forest and optimizes some objective function such as "maximize PNV".
RESOURCE ELEMENT	A collection of activities from the various operating programs required to accomplish the Forest Sevice mission and which fulfill statutory or Executive requirements. There are seven resource elements: Recreation, Wilderness, Wildlife and Fish, Range, Timber, Water, and Minerals.
RESEARCH NATURAL AREA	An area in as near a natural condition as possible, which exemplifies typical or unique vegetation and associated biotic, soil, geologic, and acquatic features. The area is set aside to preserve a representative sample of an ecological community primarily for scientific and educational purposes; commercial and general public use is not allowed.
RETENTION (VQO)	See Visual Quality Objectives (VQO).
RIDING AND HIKING AREAS	Three specific areas identified in the Ashland Unit Plan in which special management requirements were developed in to preserve the area's characteristics for recreation purposes.
RIGHT-OF-WAY	Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project facility passing over, upon, under, or through such land.
RIPARIAN AREAS	Areas with distinctive resource values and characteristics that are comprised of an aquatic ecosystem and adjacent upland areas that have direct relationships with the aquatic system. This includes floodplains, wetlands, and all areas within a horizontal distance of approximately 100 feet from the normal high water line of a stream channel, or from the shoreline of a standing body of water.
RIPARIAN ECOSYSTEM	A transition between the aquatic ecosystem and the adjacent upland terrestrial ecosystem. It is identified by soil characteristics and by distinctive vegetative communities that require free or unbounded water.
ROAD CREDITS	Credits earned by timber purchasers and which are applied toward the sale price of timber in exchange for building the roads needed for access.
ROAD MAINTENANCE LEVELS	Road maintenance levels are as follows: Level 1: Basic custodial care as required to protect the road investment and to see that damage to adjacent land and resources is held to a minimum. The road is not normally open to traffic. Level 2: Same basic maintenance as Level 1 plus logging out, brushing out, and restoring the road prism as neccessary to provide passage. Route markers and regulation signs are in place and useable. Road is open for limited passage of traffic, which is usually administrative use, permitted use, and/or specialized traffic. Level 3: Road is maintained for safe and moderately convenient travel suitable for passanger cars. Road is open for public travel, but has low traffic volumes except during short periods of time (e.g. hunting season). Level 4: At this level, more consideration is given to the comfort of the user. Road is usually surfaced with aggregate or is paved and is open for public travel. Level 5: Safety and comfort are important considerations for these roads which are open to public traffic and generally receive fairly heavy use (100 Average Daily Traffic or more). Roads have an aggregate surface or are paved.

ROAD MANAGEMENT	The combination of both traffic and maintenance management operations. Traffic management is the continuous process of analyzing, controlling and regulating uses to accomplish National Forest objectives. Maintenance management is the perpetuation of the transportation facility to serve intended management objectives.
ROADED NATURAL APPEARING RECREATION SETTING	A classification on the recreation opportunity spectrum where timber harvest or other surface use practices are evident. Motorized vehicles are permitted on all or parts of the road system.
ROADLESS AREA	A National Forest area which (1) is larger than 5000 acres or, if smaller than 5000 acres, contiguous to a designated wilderness or primitive area; (2) contains no roads and (3) has been inventoried by the Forest Service for possible inclusion in the wilderness preservation system.
ROADLESS AREA REVIEW AND EVALUATION (RARE) II	A comprehensive process, instituted in June 1977, to identify roadless and undeveloped land areas in the National Forest System and to develop alternatives for both wilderness and other resource management.
ROTATION	The planned number of years between the formation or generation of trees and their harvest at a specified stage of maturity.
ROUNDWOOD	The volume of logs or other round products required to produce lumber, plywood, woodpulp, paper, or other similar products.
RPA	See Forest and Rangeland Renewable Resources Planning Act of 1974.
RURAL RECREATION SETTING	A classification on the recreation opportunity spectrum that is characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high.
SALE SCHEDULE	See Base Sale Schedule.
SALVAGE HARVEST	The cutting of trees that are dead, dying, or deteriorating (e.g., because they are overmature or materially damaged by fire, wind, insects, fungi, or other injurious agencies) before they lose their commercial value as sawtimber.
SANITATION HARVEST	The removal of dead, damaged, or susceptible trees, essential to prevent the spread of pests or pathogens and so promote forest hygiene.
SAWTIMBER	Trees containing at least one 12-foot sawlog or two noncontiguous 8-foot logs, and meeting regional specifications for freedom from defect. Softwood trees must be at least 9 inches in diameter and hardwood trees 11 inches in diameter at breast height.
SCENIC EASEMENT	A legal interest in the land of another which allows the easement holder specified uses or rights without actual ownership of the land; in this case, control of the use of land adjacent to public highways, parks, and rivers. It may provide something attractive to look at within the easement area, an open area to look through to see something attractive beyond the easement itself, or a screen to block out an unsightly view beyond the easement area.
SCOPING PROCESS	An early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action. Identifying the significant environmental issues deserving of study and deemphasizing insignificant issues, narrowing the scope of the environmental impact statement accordingly. (Ref. CEQ requlations, 40 CFR 1501.7).
SCORIA	Porcellanite, one of the Salable minerals. Used widely for surfacing roads. Produced by nature through the pre-historic burning of coal/shale beds.
SEDIMENT	Solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site of origin by air, water, gravity, or ice.

SEED TREE CUTTING — The removal in one cut of most of the mature trees from an area, leaving only a small number of desiraable trees to provide seed for regeneration.

SEEDLING/SAPLING — A size category for forest stands in which trees less than five inches in diameter are the predominant vegetation.

SEISMIC EXPLORATION — Seismic exploration is used to map underground geological features to obtain information on the earth's subsurface and to locate areas where accumulations of oil and gas might occur.

Seimic waves, generated at or near the surface, penetrate the earth's crust and reflect from subsurface rock layers back to the surface. The geophysicist receives a printed record or seismograph from which is measured the depth to various strata and from which subsurface structures with a potential for oil and gas accumulation can be determined such as faults, anticlines, and folds.

Portable — Where access limitations, topography, or other restraints prevent use of trucks, portable operations can be performed. Two portable techniques exist for collecting data.

These are:

(1) Surface charge programs involve the detonation of a series of as much as ten-five pound charges to 25-50 pounds of explosives at shot points located at intervals along the seismic line. Surface charges can be placed directly on the ground, on snow, or on a variety of stakes or platforms. All necessary equipment to conduct the operation is transported by helicopters and then conveyed by foot travel.

(2) Various kinds of portable drills can be backpacked or delivered by helicopter to the area. A shallow subsurface portable program would involve drilling a pattern of approximately 16 holes, about 4 inches in diameter up to 50 feet deep, per mile of line. At this depth, a 10 to 40 pound charge of explosive is placed and detonated. Recording cables and geophones are laid out by foot travel.

With both of these portable techniques, shock waves generated by detonation are received and transmitted via geophones and cable to a recording device. Portable methods are generally used on more difficult terrain.

Conventional — The conventional method of collecting seismic data includes the use of truck-mounted drills and vehicle-supported crews and generally involves off-road travel. This technique involves drilling 5 to 18 5-inch diameter holes per mile to a depth of 180 to 200 feet. At this depth, a 10 to 50 pound explosive charge is placed and detonated. Shock waves are received and transmitted via geophones and cable to a truck-mounted recording device. Due to terrain restrictions, this method has limited application on the Forest.

Vibroseis — The vibroseis technique involves using truck-mounted hydraulic pads which generate energy waves through vibration rather than explosives. The vibrator method typically consists of four large trucks each equipped with a vibrator (a steel slab weighing about three tons) mounted between the front and back wheels. The vibrator pads (about 4 feet square) are lowered to the ground and vibrators on all trucks are triggered electronically from the recorder truck. Energy waves are received and transmitted via cable and geophones to a recorder truck. After the information is recorded, the trucks move forward a short distance and the process is repeated. The vibroseis operation is usually limited to roads and gentle terrain.

SELECTION CUTTING — The annual or periodic removal of trees as part of an uneven-age silvicultural system. Cutting can involve individual trees or small groups of trees to meet a predetermined goal of size and species composition in the remaining stand.

SEMI-PRIMITIVE RECREATION SETTING — A classification on the recreation opportunity spectrum that characterizes a predominately natural or natural appearing environment of a moderate to large size. Concentration of users is low, but there is often evidence of other area users. The area is managed in such a way that minimum onsite controls and restrictions may be present, but are subtle.

SENSITIVE SPECIES	Those plant or animal species which are susceptible or vulnerable to activity impacts or habitat alterations.
SEQUENTIAL BOUNDS	A set of constraints used in linear program models to establish the relationship of the quantity of an output to preceding and succeeding quantities of that output (e.g. the forage production in one time period cannot increase or decrease over ten percent from the forage production of the previous time period).
SERAL	A biotic community which is developmental; a transitory stage in an ecologic succession.
SHELTERWOOD CUTTING	The removal of a stand of trees through a series of cuttings designed to establish a new crop with seed and protection provided by a portion of the stand.
SILVICULTURAL EXAMINATION	The process used to gather the detailed in-place field data needed to determine management opportunities and direction for the timber resource within a small subdivision of a forest area such as a stand.
SILVICULTURAL PRESCRIPTION	The description of the stand and those cultural practices that are needed to manage the stand. The prescription may include direction for reforestation, thinning, weeding, or a variety of harvest systems to bring the stand into the desired condition.
SILVICULTURAL SYSTEMS	A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. It includes all cultural management practices performed during the life of the stand such as regeneration cutting, fertilization thinning, improvement cutting, and use of genetically improved tree seeds and seedlings to achieve multiple resource benefits. Systems are classified according to the method of carrying out the fellings that remove the mature crop and provide for regeneration and according to the type of Forest they produce.
SITE PREPARATION	A general term for a variety of activities that remove competing vegetation, slash, and other debris that may inhibit the reforestation effort.
SITE PRODUCTIVITY	Production capability of specific areas of land.
SLASH	The residue left on the ground after felling and other silvicultural operations and/or accumulating there as a result of storm, fire, girdling, or poisoning of trees.
SMALL GAME	Birds and small mammals normally hunted or trapped.
SNAG	A standing dead tree usually greater than 5 feet in height and 6 inches in diameter at breast height.
SOCIAL ORGANIZATION	The structure of a society described in terms of institutions, community cohesion, and community stability.
SOCIAL VARIABLE	A variable that measures the social impact of Forest Service management alternatives. Examples include population statistics, types of institutions, and personal opinion as reflected in attitudes or as demonstrated by behavior.
SOIL PRODUCTIVITY	The capacity of a soil to produce a specific crop such as fiber and forage, under defined levels of management. It is generally dependent on available soil moisture and nutrients and length of growing season.
SPATIAL FITTING	The computed-designated prescriptions state certain production values. Spatial fitting involves locating on the ground specific land areas suitable for various prescriptions within the various defined physiographic areas.
SPECIAL STIPULATIONS	Terms and conditions of use attached to leases where needed to protect specific resources or uses on National Forest System lands.
SPECIAL-USE PERMIT	A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest land for some special purpose.
STAGNATION	A condition where plant growth is markedly reduced or even arrested through, e.g., competition, state of the soil, or disease.

STAND	A community of trees or other vegetative growth occupying a specific area and sufficiently uniform in composition (species), age, spatial arrangement, and conditions as to be distinguishable from the other growth on adjoining lands, so forming a silvicultural or management entity.
STANDARD AND GUIDELINE	An indication or outline of policy or conduct.
STEP-OUT WELL	A well drilled adjacent to or near a proven well to ascertain the limits of the oil or gas reservoir. An outpost is a well drilled a further distance from a step-out but still on the same structural trend.(Distance could be a couple of miles.)
STIPULATIONS	Requirements that are part of the terms of a mineral lease. Some stipulations are standard on all Federal leases. Other stipulations may be applied to the lease at the discretion of the surface management agency to protect valuable surface resources and uses.
STOCKING	A measure of timber stand density as it relates to the optium or desired density to achieve a given management objective.
STREAM ORDER	A measure of the position of a stream in the hierarchy of tributaries. (Stream as referenced here refers to perenniel streams.) a. First-order streams are unbranched streams, that is they have no tributaries. b. Second-order streams are formed by the confluence of two or more first-order streams. They are considered second-order until they join another second-order or larger stream. c. Third-order streams are formed by the confluence of two or more second-order streams. They are considered third-order until they join another third-order or larger stream.
SUBDIVISIONS	Areas of previously undeveloped land divided into individual homesites and/or blocks of lots with streets or roads and open spaces.
SUCCESSIONAL STAG	A phase in the gradual supplanting of one community of plants by another.
SUITABILITY	The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.
SUITABILITY ANALYSIS	Process of identifying National Forest lands to be managed for timber production. Stage I identifies the biologically capable, administratively available, and technically suitable lands. Stage II consists of an economic analysis of costs and benefits of timber management on the lands identified in Stage I. Stage III provides the final assignment of suitable lands based on Forest objectives and economic efficiency.
SUITABLE FOREST LAND	Forest land (as defined in CFR 219.3) for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions; for which there is reasonable assurance that such lands can be adequately restocked (as provided in CFR 219.14); and for which there is management direction that indicates that timber production is an appropriate use of that area.
SUPPLY	The amount of an output that producers are willing to provide at a specific price, time period, and conditions of sale.
SUPPORT ELEMENT	A collection of major Forest Service activities which complement the resource elements. There are five support elements: Protection, Lands, Soils, Facilities and Rural Community and Human Resources.
SUPPRESSION (FIRE SUPPRESSION)	Any act taken to slow, stop, or extinguish a fire. Examples of suppression activities include fireline construction, backfiring, and application of water or chemical fire retardants.
SYSTEM ROADS	See Forest System Road.

TARGET	A quantifiable output assigned to the Forest.
TEMPORARY ROAD	Those roads needed only for the purchaser or permittee's use. The Forest Service and the purchaser or permittee must agree to the location and clearing widths. Temporary roads are used for a single, short-term use, e.g to haul timber from landings to Forest development roads, access to build water developments, etc..
THERMAL COVER	Cover used by animals to ameliorate chilling effects of weather; for elk, a stand of coniferous trees 40 feet or taller with an average crown closure of 70 percent or more.
THREATENED AND ENDANGERED SPECIES	Any species, plant of animal, which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its' range. Threatened species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act.
THREE-STEP SHELTERWOOD	An even-aged silvicultural system in which the old crop (the shelterwood) is removed in three successive cuttings in order to provide a source of seed and/or protection for regeneration.
TIERING	Refers to the elimination of repetitive discussions of the same issue by incorporating by reference the general discussion in an environmnetal impact statement of broader scope. For example, a project environmental assessment could be tiered to the Forest Plan EIS.
TIMBER	A general term for the major woody growth of vegetation in a forest area.
TIMBER BASE	The lands within the Forest that are suitable for timber production.
TIMBER PRODUCTION	The purposeful growing, tending, harvesting, and regeneration of rotational crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. For purposes of Forest planning, timber production does not include production of fuelwood or harvest from unsuitable lands.
TIMBER STAND IMPROVEMENT (TSI)	All noncommercial intermediate cuttings and other treatments to improve composition, condition, and volume growth of a timber stand.
TRAILHEAD	The parking, signing, and other facilities available at the terminus of a trail.
TRANSITORY RANGE	Land that is suitable for grazing use for a period of time. For example, on particular disturbed lands, grass may cover the area for a period of time before being replaced by trees or shrubs not suitable for forage.
TREE OPENING	An opening in the Forest cover created by the application of even-aged silvicultural practices. The Northern Regional Guide established size limitations and guidelines to determine when cut areas are no longer considered openings.
TRESPASS	The act of going on another's land or property unlawfully.
TWO-STEP SHELTERWOOD	An even-aged silvicultural system in which the old crop (shelterwood) is removed in two successive cuttings in order to provide a source of seed and/or protection for regeneration.
UNDERSTORY	The trees and other woody species which grow under a more or less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth.
UNEVEN-AGED MANAGEMENT	The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection. Individual Tree Selection Cutting — The removal of selected trees from specified size and age classes over the entire stand area in order to meet a predetermined goal of size or age distribution and species composition in the remaining stand.

	Group Selection Cutting — The removal of small groups of trees to meet a predetermined goal of size distribution and species in the remaining stand.
UNPLANNED IGNITIONS	A fire started at random by either natural or human causes, or a deliberate incendiary fire. Acceptance of unplanned ignitions as a prescribed fire must be within an approved plan.
UNREGULATED HARVEST	This harvest is not charged against the allowable sale quantity. It includes occasional volumes removed that were not recognized in calculations of the allowable sale quantity, such as cull or dead material and noncommercial species and products. It also includes all volume removed from unsuitable areas. Harvests from unsuitable areas will be programmed as needed to meet multiple use objectives other than timber production and for improvement of administrative sites.
UNSUITABLE TIMBER LAND	Lands not selected for timber production in Step II and III of the suitablility analysis during the development of the Forest Plan due to (1) the multiple-use objectives for the alternative preclude timber production, (2) other management objectives for the alternative limit timber production activities to the point where management requirements set forth in 36 CFR 219.27 cannot be met and (3) the lands are not cost-efficient over the planning horizon in meeting forest objectives that include timber production. Land not appropriate for timber production shall be designated as unsuitable in the Forest Plan.
UTILITY CORRIDOR	See Corridor
UTILIZATION STANDARDS	Standards guiding the use and removal of timber. They are measured in terms of diameter at breast height (d.b.h.) and top of the tree inside the bark (top d.i. b.) and the percentages of "soundness" of the wood.
VALUE, MARKET	The unit price of an output normally exchanged in a market after at least one stage of production, expressed in terms of what people are willing to pay as evidenced by market transactions.
VALUE, NONMARKET	The unit price of an output not normally exchanged in a market after at least one stage before consumption, and thus must be imputed from other economic information.
VEGETATION TREATMENT	Any activities undertaken to modify the existing condition of the vegetation.
VIABLE POPULATION	A population which has adequate numbers and dispersion of reproductive individuals to ensure the continued existence of the species population in the planning area.
VISITOR INFORMATION SERVICE (VIS) SITE	A site which provides interpretative information, (directional, historical, statistical) located at Forest historical sites, overlook sites, or special interest areas.
VISUAL QUALITY OBJECTIVE (VQO)	A desired level of scenic quality and diversity of natural features based on physical and sociological characteristics of an area. Refers to the degree of acceptable alterations of the characteristic landscape.
	Preservation: In general, human activities are not detectable to the visitor.
	Retention: Human activities are not evident to the casual Forest visitor.
	Partial Retention: Human activities may be evident, but must remain subordinate to the characteristic landscape.
	Modification: Human activity may dominate the characteristic landscape but must, at the same time, utilize naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in middle-ground or background.
	Maximum Modification: Human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

	Enhancement: A short-term management alternative which is done with the express purpose of increasing positive visual variety where little variety now exists.
VISUAL RESOURCE	The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.
WALLOW	A depression, pool of water, or wet area produced or utilized by elk or moose during the breeding season.
WATER YIELD	The measured output of the Forest's streams.
WATER YIELD INCREASE	Additional water released to the Forest streams as a result of Forest management activities.
WEEDING	Generally a cultural operation eliminating or suppressing undisturbed vegetation, mainly herbaceous, during the seedling stage of a forest crop, thus reducing competition with the seedling stand.
WET AREAS	Sites, often occurring at the heads of drainages, such as wet sedge meadows, bogs, or seeps. They are often referred to as "moist sites" and are very important components of elk summer range. Sites near water are important because the forage they produce is highly nutritious and heavily utilized by elk.
WETLANDS	Those areas that are inundated by surface or ground water with a frequency sufficient, under normal circumstances, to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands include marshes, bogs, sloughs, potholes, river overflows, mud flats, wet meadows, seeps, and springs.
WILDERNESS	Federal land retaining its primeval character and influence without permanent improvements or human habitation as defined under the 1964 Wilderness Act. It is protected and managed so as to preserve its natural conditions which (1) generally appear to have been affected primarily by forces of nature with the imprint of man's activity substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and confined type of recreation; (3) has at least 5,000 acres or is of sufficient size to make practical its preservation, enjoyment, and use in an unimpaired condition, and (4) may contain features of scientific, educational, scenic, or historical value as well as ecologic and geologic interest.
WILDERNESS STUDY	An analysis to determine an area's appropriateness, cost, and benefits for addition to the National Wilderness Preservation System.
WITHDRAWAL	An order removing specific land areas from availability for certain uses.
WOODY DRAWS	A classification of areas, particularly in grassland settings, where an overstory of woody vegetation in small drainages creates habitat for many wildlife species and shade/wind protection and forage for livestock. The vegetation is a result of higher moisture conditions than in the surrounding area but surface water if any, running thru the area is generally short term.
WORK YEAR EQUIVALENTS	This is 2,087 working hours. May be accomplished by one persons working yearlong or several people filling seasonal positions.
YARDING	The operation of hauling timber from the stump to a collecting point.
ZONE OF INFLUENCE	A delineated geographic area within which the present and proposed actions exert an important influence on residents and visitors.

CHAPTER VIII
REFERENCES

CHAPTER 8
REFERENCES

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