

United States
Department of
Agriculture



Lewis and Clark
National Forest Plan
P.O. Box 871
Great Falls, Mt. 59403

H-11

... A Report and Final Environmental Impact
Statement

Middle Fork Judith and Big Snowies Montana Wilderness Study Act Areas



Photo: Top of Canyons in the Middle Fork Judith Wilderness Study Area.

FINAL ENVIRONMENTAL IMPACT STATEMENT

Middle Fork Judith and Big Snowies Montana Wilderness Study Act Areas

Type of Action: Legislative

Responsible Federal Agency: Forest Service, USDA

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Abstract: This Final Environmental Impact Statement describes the proposed alternatives and other alternative for the Middle Fork Judith and Big Snowies Montana Wilderness Study Act Areas. Nonwilderness management is recommended for both areas. The land area involved is 189,885 acres in Judith Basin, Cascade, Meagher, Fergus, and Golden Valley Counties, Montana.

This environmental impact statement documents the analysis of the two MWSA (Montana Wilderness Study Act) areas on the Lewis and Clark National Forest, by disclosing the environmental consequences of implementing the proposed action and alternatives. The proposed action is the basis for the recommendation to Congress on the wilderness suitability of the Big Snowies and Middle Fork Judith Wilderness Study Areas.

Congress has reserved the right to make final decisions on wilderness designation. Until Congress determines otherwise, the wilderness study areas will be managed, subject to existing private rights and uses, to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System.

Date of Transmission of the Draft Environmental Impact Statement to Environmental Protection Agency and to the Public: July 26, 1982.

Date of Transmission of the Final Environmental Impact Statement to Environmental Protection Agency and to the Public: _____.

FEIS.
MONTANA WILDERNESS
STUDY ACT AREAS

INTRODUCTION

This Final Environmental Impact Statement deals with the Middle Fork Judith and Big Snowies MWSA (Montana Wilderness Study Act Areas).

Chapter I, Purpose and Need, describes the legislative framework, planning process, general description, and issues of the two wilderness study areas.

Chapter II, Alternatives Considered, describes the alternatives for managing the MWSA areas analyzed in the planning process.

Chapter III, Affected Environment, describes the various environments of the MWSA areas.

Chapter IV, Environmental Consequences, forms the scientific and analytical basis for the comparison of the alternatives.

Chapter V, List of Preparers; Chapter VI, List of Persons, Agencies, and Organizations To Whom Copies of Statements are Sent; and Chapter VII, Consultation with Others, are self-explanatory. Glossary, Appendixes, Bibliography and Index are also included.

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SUMMARY

Overview

The first part of this Summary describes the MWSA (Montana Wilderness Study Act), the planning process and a general description of the areas. The second part describes alternative formulation, opportunity for change, and alternatives that were eliminated from detail study. Next the alternatives that were considered in detail for the Middle Fork Judith are described. Table S2.1 shows the allocation of land by management emphasis, and Table S2.2 shows the resource production and effects by alternative for the Middle Fork Judith. Last the comparison, evaluation, and effect are summarized.

These items are repeated for the Big Snowies. Table S2.3 shows the allocation of land by management emphasis, and Table S2.4 shows the resource production and effects by alternative.

A more detailed description of these actions can be found in the FEIS (Final Environmental Impact Statement) for the Middle Fork Judith and Big Snowies Montana Wilderness Study Act Areas.

Detailed information of the management of the Lewis and Clark National Forest under the Preferred Alternative can be found in the Lewis and Clark Forest Plan.

These documents are available for review at Lewis and Clark offices in Augusta, Choteau, Stanford, Harlowton, White Sulphur Springs, Belt Creek, and Great Falls. Send requests for copies of the FEIS or Forest Plan to:

Lewis and Clark National Forest
P.O. Box 871
Great Falls, MT 59403

Legislative Framework

Montana Wilderness Study Act

On November 1, 1977, Congress passed the Montana Wilderness Study Act (Public Law 95-150). The Act requires the Secretary of Agriculture to study and make recommendations to Congress on the wilderness suitability of nine separate National Forest areas in Montana containing 973,000 acres.

In the MWSA (Montana Wilderness Study Act), Congress specified that the nine areas be studied using the procedures in Sections 3(b) and 3(d) of the Wilderness Act (Public Law 88-577).

RARE II

From June 1977 to January 1979 the Forest Service conducted the RARE II (Roadless Area Review and Evaluation) study. The purpose of RARE II was to inventory all roadless and undeveloped areas in the National Forest System and recommend their allocations to wilderness, further planning, or nonwilderness.

All of the MWSA areas were included in the RARE II process, and all were recommended for further planning. Further planning means more information is needed before a wilderness or nonwilderness recommendation can be made.

Wilderness Study

In November 1979, the Regional Forester decided to conduct a Regional study of three of the MWSA areas, with the remaining six to be analyzed by the respective Forests.

This environmental impact statement documents the analysis of the two MWSA areas on the Lewis and Clark National Forest, by disclosing the environmental consequences of implementing the proposed action and alternatives. The proposed action is the basis for the recommendation to Congress on the wilderness suitability of the Big Snowies and Middle Fork Judith Wilderness Study Areas.

Planning Process

Planning Process

The planning process uses an interdisciplinary approach in developing the alternatives. This interdisciplinary approach was used throughout the planning process in analyzing the affected area, estimating the environmental effects, and writing the FEIS (Final Environmental Impact Statement). The interdisciplinary team used during this process included specialists from the natural and social sciences and environmental design arts. Frequent interaction between team members ensured consideration of all resources and interests in the analysis and decisions documented in the FEIS. Interdisciplinary team members are listed in the planning record, "Lewis and Clark National Forest Work Plan," and in the "List of Preparers," Chapter V of the EIS.

The planning process, outlined in implementing regulations of the National Forest Management Act, was followed to develop the proposed action. The planning actions, as specified in the regulations and used in the Forest Planning process, are:

1. Identification of issues, concerns, and opportunities
2. Development of planning criteria
3. Inventory of data and information collection
4. Analysis of the management situation
5. Formulation of alternatives
6. Estimated effects of alternatives
7. Evaluation of alternatives
8. Selection of the preferred alternative
9. Implementation
10. Monitoring and evaluation

Remaining Process

This DEIS was prepared after completion of planning actions 1 through 7. As part of planning action 7, a DEIS was prepared for public review. Following the review period the team repeated steps 1 thru 7 as needed and this FEIS was prepared, filed with the Environmental Protection Agency, and made available to the public.

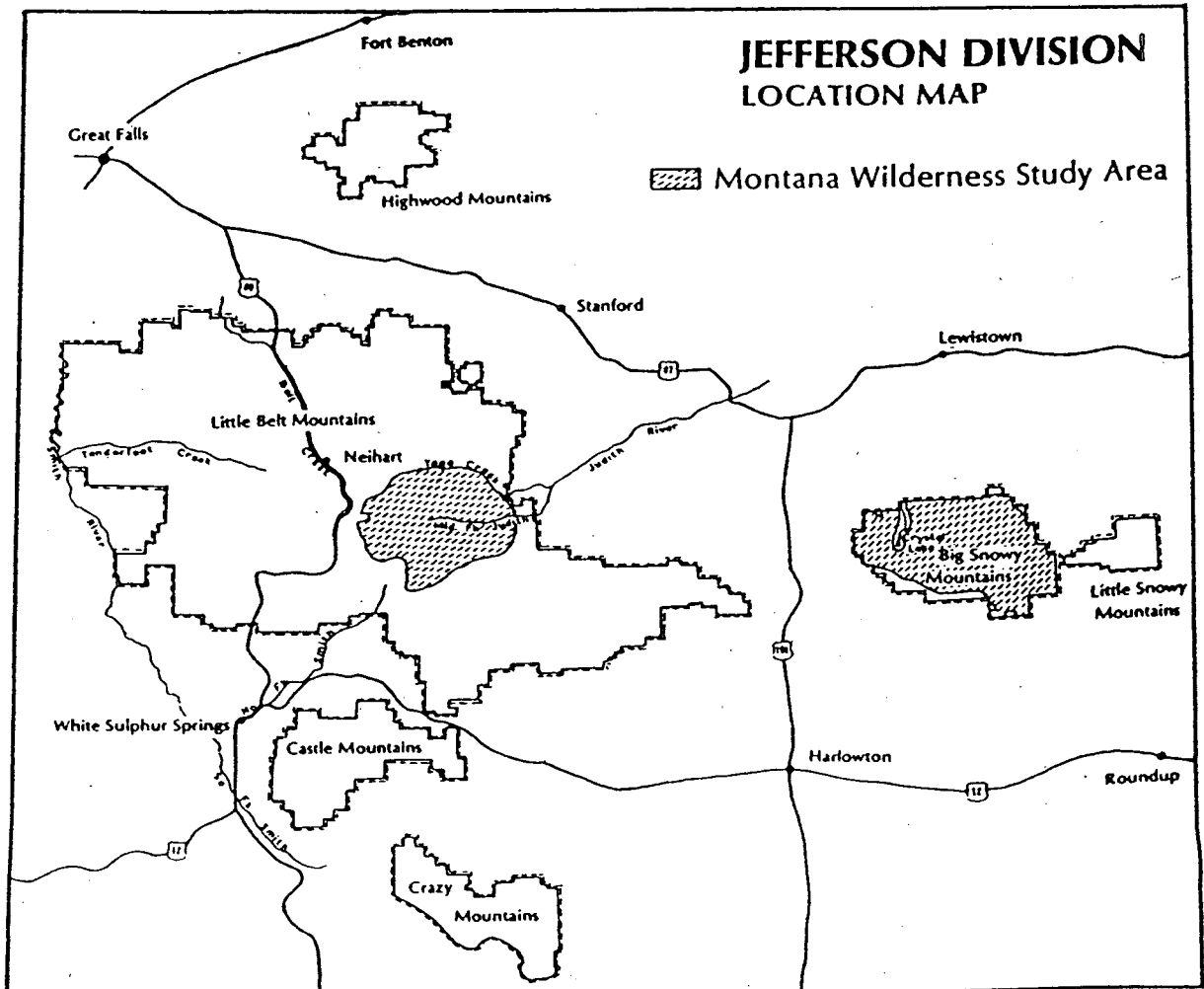
Congress has reserved the right to make final decisions on wilderness designation. Until Congress determines otherwise, the wilderness study areas will be managed subject to existing private rights and uses, to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System.

General Description

Study Areas

The Lewis and Clark National Forest is in north central Montana within the upper Missouri River System. Historically, the Forest has been referred to by two major divisions.

The Jefferson Division lies east and south of Great Falls and is surrounded by private or other federal and state lands. The Jefferson Division, in Cascade, Chouteau, Judith Basin, Fergus, Golden Valley, Wheatland, Sweetgrass, Park, and Meagher Counties, has six distinct mountain ranges. The Crazy Mountains lie southwest of Harlowton. The north half is administered by the Lewis and Clark National Forest and the south half by the Gallatin National Forest. The other mountain ranges in this Division are: the Little Belt Mountains, southeast of Great Falls; Castle Mountains, southeast of White Sulphur Springs; Big Snowy and Little Snowy Mountains, south of Lewistown; and Highwood Mountains, east of Great Falls.



Alternative Formulation

ALTERNATIVE FORMULATION

Alternative formulation, Forest planning action 5, resulted from the four planning actions described below.

Planning Action 1 - Identification of Issues, Concerns, and Opportunities

Public issues and management opportunities were identified through public involvement and coordination with other Federal agencies, state agencies and local governments. Forest Service management concerns were added. These issues and concerns are listed in Chapter I. Details on the process used to develop issues, concerns, and opportunities are available in the planning record, "MWSA Workshop Analysis Summary."

Planning Action 2 - Development of Planning Criteria

Planning process and management criteria were established. The interdisciplinary team developed criteria for the inventory data collection, the management situation analysis, and the alternative formulation. Process criteria are documented in the planning record, "Proposed Criteria and Documentation."

Planning Action 3 - Inventory of Data and Information Collection

By using Forest resource inventories, a multi-resource data base was formed and stored in a computer retrieval system. A timber stand analysis specific to the MWSA areas was completed and used in the formulation of timber yield tables. Details of the data base content are in the planning record, "Data Base Components." Social and economic data for the counties directly affected by the Forest are in the planning record, "Social Impact Assessment Baseline, 1980."

Planning Action 4 - Analysis of the Management Situation

The Analysis of the Management Situation identified: (1) feasible ranges of goods, services, and uses; (2) projected use levels; (3) potential to resolve issues and concerns; and (4) the feasibility of providing the levels of goods, services, and uses resulting from assigned RPA objectives. This analysis identified the opportunity to change management direction and is documented in the planning record, "Analysis of the Management Situation." The Middle Fork Judith and Big Snowies MWSA areas were included in the analysis.

Planning Action 5 - Formulation of Alternatives

Alternatives list different ways to address and respond to the major public issues, management concerns, and resource opportunities. Alternatives result from planning actions 1 through 4 and are documented in the planning record, "Alternatives."

Considering Change From Current Direction

OPPORTUNITY FOR CHANGE

The MWSA directs that the Middle Fork Judith and Big Snowies be studied for possible inclusion into the National Wilderness Preservation System. As part of this study, the Analysis of the Management Situation for the Forest identified opportunities to change management direction for individual resources. Additional analysis was done for the Middle Fork Judith and Big Snowies Wilderness Study Areas. Currently the areas are managed to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System until Congress determines otherwise. The following resources were examined for the opportunity to change from current direction.

Dispersed Recreation

Recreation opportunity is the projected capacity of an area to provide dispersed recreation based on the area's recreation setting. Current available dispersed recreation opportunity is 28,000 RVDs (Recreation Visitor Days) in the Middle Fork Judith and 20,600 RVDs in the Big Snowies. Current use is 20,800 RVDs in the Middle Fork Judith and 5,700 in the Big Snowies.

The maximum available dispersed recreation opportunity is 333,100 RVDs in the Middle Fork and 163,100 RVDs in the Big Snowies. It would be attained by accessing undeveloped lands. This would cause a change in the recreation setting from semi-primitive to roaded natural. A roaded natural setting provides more dispersed recreation opportunity.

The least available dispersed recreation opportunity is 23,000 RVDs in the Middle Fork and 11,500 RVDs in the Big Snowies. This would occur under wilderness classification. Wilderness, by its nature, requires solitude and tranquility.

Wilderness

The maximum area in the two study areas which could be classified as wilderness is 189,885 acres.

Wildlife

The current elk population is 1,200 animals in the Middle Fork Judith and 100 animals in the Big Snowies. The maximum elk population for these areas cannot be determined. Both areas contain little big game winter habitat. Winter habitat is the limiting factor for elk population in these areas.

Considering Change From Current Direction

Range

The current grazing level is 900 AUMS (Animal Unit Months) in the Middle Fork and 2,700 AUMs in the Big Snowies. Under maximum production, the Middle Fork could provide 1,500 AUMs and the Big Snowies could provide 3,700 AUMs.

Timber

The Middle Fork Judith has a standing volume of 460 million board feet. If all the available and capable lands were regulated for timber harvest, and rotation age was the culmination of mean annual increment, 3.84 million board feet could be harvested each year.

The Big Snowies has a standing volume of 317 million board feet. If all the available and capable lands were regulated for timber harvest, and rotation age was the culmination of mean annual increment, 3.41 million board feet could be harvested each year.

Minerals

The Middle Fork Judith has a high potential for hardrock minerals and low or no potential for oil and gas.

The Big Snowies has a low potential for hardrock minerals and oil and gas.

Alternatives

ALTERNATIVES DEVELOPED

After completing the analysis of the management situation the alternatives were developed. Effort was concentrated in developing a reasonable range of alternatives that could be analyzed within the limits set by the capability of the Forest and that were responsive to public issues and management concerns.

ALTERNATIVES ELIMINATED FROM DETAILED STUDY

The Forest developed and examined several alternatives which were eliminated from detailed analysis.

Part Wilderness/ Part Other Management

An alternative which would recommend the Middle Fork of the Judith as wilderness and the Lost Fork for commodities was examined. This alternative was eliminated from detail study because it substantially reduced the wilderness quality of the Middle Fork Judith with only a slight increase in commodity products.

An alternative which would manage the upper Middle Fork of the Judith for commodity products and would recommend the rest of the study area for wilderness classification was examined. This alternative was eliminated from detail study because most of the effects, except for wilderness classification, are similar to Alternative 6.

Boundary Changes

The boundary of each alternative was carefully examined to see if resource conflicts could be reduced by adjusting the boundary.

The Middle Fork Judith contains 64 miles of primitive or low standard roads; these roads are throughout the study area. Several areas are of known mineral interest. These could be excluded from the study area by minor boundary changes. There are 1,154 acres of private land in the middle of the study area. Three areas have been identified where human activities are readily apparent. Little opportunity is available to reduce resource conflict or increase user opportunity by modifying the boundary, with the exception of the mineral areas.

The Big Snowies contains 50 miles of low standard roads. These roads penetrate almost all major drainages. The opportunities for boundary changes are small and would not significantly affect resource outputs or uses.

Alternatives

Special Management

The use of special management area designation under 36 CFR 294 was considered. This designation recognizes unique areas with outstanding attributes which should have some type of National designation. Neither the Middle Fork Judith nor Big Snowies are perceived to have these attributes.

NFMA regulations through the Forest planning process provide the Regional Forester with the authority to establish management direction for all areas. This authority would be equal to a special management designation.

**ALTERNATIVES
CONSIDERED IN DETAIL**

Following are the alternatives studied in detail. Pages S1-9 deal with the Middle Fork Judith and pages S1-15 deal with the Big Snowies.

Alternative 1

The Middle Fork Judith Wilderness Study Area would be managed for semi-primitive recreation and wildlife habitat, especially elk habitat, through improvement practices.

Alternative 2

The Middle Fork Judith Wilderness Study Area would be recommended for wilderness classification.

Alternative 3

The Middle Fork Judith Wilderness Study Area would be managed to provide a high level of commodity products, to meet the RPA Recommended Program.

Alternative 4

The Middle Fork Judith Wilderness Study Area would be managed to provide a moderate level of commodity products.

Alternative 5

The Middle Fork Judith Wilderness Study Area would be managed for a low level of commodity products.

Alternative 6

The Upper Middle Fork Judith would be managed for commodity products; the remaining part of the area would be managed for semi-primitive recreation and wildlife habitat.

Alternative 7 - Preferred

The Harrison Creek and Weatherwax drainages, in the Upper Middle Fork, would be managed for commodity products. The remaining area would be managed for semi-primitive recreation and wildlife habitat.

The allocation of land management emphasis by alternative is shown in Table S2.1. A summary of resource production and effects for the alternatives is shown in Table S2.2.

TABLE S2.1 Allocation of Acres to Management Emphasis by Alternative - Middle Fork Judith

	<u>ALT-1</u>	<u>ALT-2</u>	<u>ALT-3</u>	<u>ALT-4</u>	<u>ALT-5</u>	<u>ALT-6</u>	<u>ALT-7</u> (Preferred)
Minimum Level Management	88140	0	33257	33570	83530	75696	78134
Range Management	2436	0	4980	6770	2525	981	981
Timber Management	0	0	40681	42876	910	10412	8810
Timber/Range Management	0	0	222	0	149	2064	2064
Timber/Wildlife/ Visual Management	0	0	11576	7363	4885		0
Wildlife Management	1424	0	1284	1421	0	2011	2011
Wilderness Management	0	92000	0	0	0	0	0

TABLE S2.2 Summary of Total Resource Production by Alternative - Middle Fork Judith (Average Annual Output)

RESOURCE USE AND DEVELOPMENT FACTORS		UNITS	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6	ALT-7 (Preferred)
<u>Recreation Use Potential by 2030</u>		Thousand RVDs							
(Base Year in Parentheses)									
- Primitive (0)			0	23.0	0	0	0	0	0
- Semi-Primitive (28.0)			28.0	0	0	2.7	15.7	21.1	24.5
- Roaded Natural Appearing (0)			0	0	333.1	303.3	138.5	87.2	42.0
<u>Recreation Setting by 2030</u>		Thousand Acres							
(Base Year in Parentheses)									
- Wilderness (0)			0	92.0	0	0	0	0	0
- Semi-Primitive (92.0)			92.0	0	0	8.3	53.8	67.8	80.4
- Roaded Natural Appearing (0)			0	0	92.0	83.7	38.2	24.2	11.6
<u>Visual Quality Objectives</u>		Acres							
- Preservation			0	92.0	0	0	0	0	0
- Partial Retention			92.0	0	0	8.3	53.8	67.8	80.4
- Modification			0	0	92.0	83.7	38.2	24.2	11.6
<u>Wildlife</u>									
- Habitat Improvement	Acre Equivalents								
-1982-1990		30	0	70	30	30	70	70	70
-2021-2030		30	0	100	30	30	70	70	70
- Elk Population Potential	Number								
-1982-1990		1200	1200	1200	1200	1200	1200	1200	1200
-2021-2030		1200	1200	1120	1120	1180	1180	1200	1200
- Elk Hunter Recreation	Hunter Days								
-1982-1990		8000	8000	7100	7700	7800	8000	8000	8000
-2021-2030		8000	8000	4500	4300	7200	7300	7300	7300
<u>Range</u>		AUMs							
-1982-1990		900	900	900	900	900	900	900	900
-2021-2030		900	900	980	940	980	940	940	940
<u>Timber</u>		Acres							
- Land Available, Capable, and Suitable			0	0	52.5	50.2	5.9	13.3	10.9

<u>RESOURCE USE AND DEVELOPMENT FACTORS</u>	<u>UNITS</u>	<u>ALT-1</u>	<u>ALT-2</u>	<u>ALT-3</u>	<u>ALT-4</u>	<u>ALT-5</u>	<u>ALT-6</u>	<u>ALT-7</u> (Preference)
<u>Timber (Continued)</u>								
- Allowable Sale Quantity	Million Board Feet							
- 1982-1990		0	0	10.6	3.9	3.5	0	0
- 1991-2000		0	0	0	6.0	0	1.1	.7
- 2001-2010		0	0	7.8	12.1	2.3	1.1	.7
- 2011-2020		0	0	7.2	.5	0	.5	.7
- 2021-2030		0	0	2.7	4.5	.3	.5	.7
- Reforestation (Natural and Planting)	Acres							
- 1982-1990		0	0	1270	440	400	0	0
- 1991-2000		0	0	0	670	0	120	80
- 2001-2010		0	0	870	1350	260	120	80
- 2011-2020		0	0	800	60	0	60	80
- 2021-2030		0	0	300	500	40	60	80
<u>Roads</u>								
- Arterial and Collector to be constructed	Miles							
- 1982-1990		0	0	.9	.6	.6	0	0
- 1991-2000		0	0	0	.6	0	.6	0
- 2001-2010		0	0	.2	.2	.3	.3	0
- 2011-2020		0	0	.6	0	0	.2	0
- 2021-2030		0	0	0	0	.2	0	0
- Local	Miles							
- 1982-1990		0	0	13	4	4	0	0
- 1991-2000		0	0	0	7	0	1	1
- 2001-2010		0	0	9	14	3	1	1
- 2011-2020		0	0	8	1	0	1	1
- 2021-2030		0	0	3	5	1	1	0
<u>Prescribed burning</u>	Acres	10	0	60	30	40	50	50
<u>Social/Economic</u>								
- Change in Employment								
1982-1990	Person Years	0	0	140	50	45	0	0
2021-2030		0	0	35	60	5	5	5

<u>RESOURCE USE AND DEVELOPMENT FACTORS</u>	<u>UNITS</u>	<u>ALT-1</u>	<u>ALT-2</u>	<u>ALT-3</u>	<u>ALT-4</u>	<u>ALT-5</u>	<u>ALT-6</u>	<u>ALT-7</u> (Preferred)
<u>Returns to U.S. Government</u> <u>1/</u>	Thousand Dollars							
- 1982-1990		6.6	1.6	218.6	84.6	76.6	6.6	6.6
- 2021-2030		6.6	1.6	60.8	96.8	12.7	16.7	20.6
<u>Total Budget required to implement</u> <u>1/</u>	Thousand Dollars							
- 1982-1990		72.3	62.4	286.4	166.0	166.0	141.6	72.4
- 2021-2030		72.3	62.4	124.1	158.4	242.7	78.4	85.7
<u>Present Net Value @ 4%</u> <u>1/</u>	Thousand Dollars	4858.8	5406.4	43302.8	37778.9	10550.7	7099.8	7513.7

1/ Values given in 1978 dollars

ALTERNATIVE SUMMARY

This part of the chapter summarizes the comparison and evaluation of alternatives.

Alternative 1

Alternative 1 would maintain the Middle Fork Judith Wilderness Study Area much like it is today. The area would remain undeveloped and timber would not be harvested on a regulated basis. Both motorized and nonmotorized semi-primitive recreation opportunities would be provided. Game and nongame habitat would not change. Elk and hunting opportunities would not change. Direct effects would be a loss of primitive recreation (wilderness) and timber management opportunities.

Alternative 2

Alternative 2 would recommend wilderness classification for the Middle Fork Judith Wilderness Study Area. Wilderness designation would result in the area being managed to leave it unimpaired for future generations use and enjoyment. Timber and motorized recreation opportunities would be foregone.

Alternative 3

Alternative 3 would provide the highest levels of timber and range outputs. All of the study area would be developed. Although elk numbers would decrease slightly, hunting recreation would be substantially reduced because of an increase in openings and more road access. Wildlife habitat improvement would change and most wildlife habitat improvement would be directed at mitigating the effects of other programs. Direct effects would be a loss of the most acres of semi-primitive recreation opportunity and elk security habitat.

Alternative 4

Like Alternative 3, Alternative 4 would also provide high levels of timber and range outputs. About 90 percent of the study area would be developed. Elk numbers would decrease slightly and hunting recreation would be substantially reduced. Most wildlife habitat improvement would be directed at mitigating other programs. Direct effects would be the loss of semi-primitive recreation opportunity and elk security habitat.

Alternative 5

Alternative 5 would provide moderate levels of timber and range outputs. About 40 percent of the study area would be developed. Hunting recreation would decrease although there would be only a small decrease in elk numbers. The lower canyon area would provide semi-primitive recreation opportunities. Direct effects would be a loss of semi-primitive recreation opportunity and elk security habitat on 38,240 acres.

Alternative 6

Alternative 6 would provide a low level of timber and a moderate level of range outputs. About 25 percent of the area would be developed. Both roaded natural and semi-primitive recreation opportunities would be provided. Elk populations and hunting opportunity would decrease slightly.

**Alternative 7
Preferred**

Alternative 7 would provide a low level of timber in the Harrison Creek Weatherwax drainage and a moderate level of range outputs. About 10 percent of the area would be developed. Both roaded natural and semi-primitive recreation opportunity would be maintained, because new roads would be closed to protect game habitat and maintain hunting quality.

**ALTERNATIVES
CONSIDERED IN DETAIL**

The following alternatives for the Big Snowies Wilderness Study Area were considered in detail.

**Alternative 1 --
Preferred Alternative**

The Big Snowies Wilderness Study Area would be managed for semi-primitive recreation and wildlife habitat.

Alternative 2 --

The Big Snowies Wilderness Study Area would be recommended for wilderness classification.

Alternative 3 --

The Big Snowies Wilderness Study Area would be managed to provide a high level of commodity products.

Alternative 4 --

The Big Snowies Wilderness Study Area would be managed to provide a moderate level of commodity products.

Alternative 5 --

The Big Snowies Wilderness Study Area would be managed to provide a low level of commodity products.

The allocation of land management emphasis by alternative is shown in Table S2.3. A summary of resource outputs for the alternatives is shown in Table S2.4.

TABLE S2.3 Allocation of Acres to Management Emphasis by Alternative - Big Snowies

	<u>ALT-1</u> (Preferred)	<u>ALT-2</u>	<u>ALT-3</u>	<u>ALT-4</u>	<u>ALT-5</u>
Minimum Level Management	85289	0	27369	30715	47540
Range Management	9603	0	13220	16131	22182
Timber Management	0	0	28119	44375	23161
Timber/Range Management	0	0	3947	3115	777
Timber/Wildlife/ Visual Management	0	0	14880	648	1499
Wildlife Management	2812	0	5223	2901	2726
Wildlife/Range Management	181	0	5126	0	0
Wilderness Management	0	97885	0	0	0

TABLE MS2.4 Summary of Total Resource Production by Alternative - Big Snowies (Average Annual Output)

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT-1 (Preferred)	ALT-2	ALT-3	ALT-4	ALT-5
<u>Recreation Use Potential by 2030</u>	Thousand RVDs					
- Primitive		0	11.5	0	0	0
- Semi-Primitive		20.6	0	0	3.4	8.2
- Roaded Natural Appearing		0	0	163.1	136.3	97.9
<u>Recreation Setting by 2030</u>	Thousand Acres					
- Wilderness		0	97.9	0	0	0
- Semi-Primitive		97.9	0	0	16.0	39.1
- Roaded Natural Appearing		0	0	97.9	81.9	58.8
<u>Visual Quality Objectives</u>	Thousand Acres					
- Preservation		0	97.9	0	0	0
- Partial Retention		97.9	0	0	16.0	39.1
- Modification		0	0	97.9	81.9	58.8
<u>Wildlife</u>						
- Habitat Improvement	Acre Equivalents					
- 1982-1990		110	0	290	100	100
- 2021-2030		110	0	320	100	100
- Elk Population Potential	Number					
- 1982-1990		100	100	100	100	100
- 2021-2030		100	100	100	100	100
- Elk Hunter Recreation	Hunter Days					
- 1982-1990		1000	1000	1000	1000	1000
- 2021-2030		1000	1000	800	900	900
<u>Range</u>	AUMs					
- 1982-1990		3000	2700	3000	3000	3000
- 2021-2030		3300	2700	3600	3600	3300
<u>Timber</u>						
- Land Available, Capable, and Suitable	Thousand Acres	0	0	46.1	49.9	44.8
- Allowable Sale Quantity	Million Board Feet					
- 1982-1990		0	0	.4	.4	.4
- 1991-2000		0	0	0	0	1.6
- 2001-2010		0	0	.2	.2	.2
- 2011-2020		0	0	3.9	2.1	1.1
- 2021-2030		0	0	5.3	1.9	3.4

<u>RESOURCE USE AND DEVELOPMENT FACTORS</u>	<u>UNITS</u>	<u>ALT-1</u> (Preferred)	<u>ALT-2</u>	<u>ALT-3</u>	<u>ALT-4</u>	<u>ALT-5</u>
<u>Timber (Continued)</u>						
- Reforestation (Natural and Planting)	Acres					
- 1982-1990		0	0	40	40	50
- 1991-2000		0	0	0	0	210
- 2001-2010		0	0	20	20	30
- 2011-2020		0	0	480	260	140
- 2021-2030		0	0	660	240	430
<u>Roads</u>						
- Arterial and Collector to be constructed	Miles					
- 1982-1990		0	0	.8	.8	.8
- 1991-2000		0	0	0	0	1.5
- 2001-2010		0	0	.5	.5	.5
- 2011-2020		0	0	3.1	3.9	1.0
- 2021-2030		0	0	4.6	3.9	3.1
- Local	Miles					
- 1982-1990		0	0	1	1	1
- 1991-2000		0	0	0	0	2
- 2001-2010		0	0	1	1	1
- 2011-2020		0	0	5	3	2
- 2021-2030		0	0	7	3	4
<u>Facilities</u>						
- Disturbance from Rooding Arterial and Collector	Acres					
- 1982-1990		0	0	5.6	5.6	5.6
- 1991-2000		0	0	0	0	10.5
- 2001-2010		0	0	3.5	3.5	3.5
- 2011-2020		0	0	21.7	25.5	7.0
- 2021-2030		0	0	32.2	25.5	21.7
- Local						
- 1982-1990		0	0	5	5	5
- 1991-2000		0	0	0	0	10
- 2001-2010		0	0	5	5	5
- 2011-2020		0	0	25	15	10
- 2021-2030		0	0	35	15	10

<u>RESOURCE USE AND DEVELOPMENT FACTORS</u>	<u>Units</u>	<u>ALT-1</u> (Preferred)	<u>ALT-2</u>	<u>ALT-3</u>	<u>ALT-4</u>	<u>ALT-5</u>
<u>Prescribed burning</u>	Acres	90	0	220	130	100
<u>Change in Employment</u>	Person Years					
- 1982-1990		0	0	5	5	5
- 2021-2030		0	0	70	25	45
<u>Change in Income</u>	Thousand Dollars					
- 1982-1990		0	0	80	80	80
- 2021-2030		0	0	990	360	640
<u>Returns to U.S. Government 1/</u>	Thousand Dollars					
- 1982-1990		52.4	4.9	60.4	60.4	60.4
- 2021-2030		52.4	4.9	159.5	71.5	120.7
<u>Total Budget required to implement 1/</u>	Thousand Dollars					
- 1982-1990		111.0	83.6	165.4	165.6	165.6
- 2021-2030		123.3	82.0	315.8	240.0	277.7
<u>Present Net Value @ 4%</u>	Thousand Dollars	-677.4	427.7	558.1	151.2	341.0

1/ Values given in 1978 dollars

- Alternative 1 - Preferred** Alternative 1 would maintain the Big Snowies Wilderness Study Area much like it is today. The area would remain undeveloped and timber would not be harvested on a regulated basis. Both motorized and nonmotorized semi-primitive recreation opportunities would be provided. Direct effects would be a loss of primitive recreation (wilderness) and timber management opportunities.
- Alternative 2** Alternative 2 would recommend wilderness classification for the Big Snowies Wilderness Study Area. Wilderness designation would result in the area being managed in such a manner as to leave it unimpaired for future generations' use and enjoyment. Timber and motorized recreation opportunities would be foregone.
- Alternative 3** Alternative 3 would provide the highest levels of timber and range outputs. All of the study area would be developed. Semi-primitive recreation opportunities would be foregone. Wildlife security habitat would be reduced.
- Alternative 4** Alternative 4 also provides high levels of timber and range outputs. About 85 percent of the study area would be developed. Most semi-primitive recreation opportunities would be foregone. Wildlife security habitat would be reduced.
- Alternative 5** Alternative 5 would provide moderate levels of timber and range outputs. About 60 percent of the study area would be developed. Many semi-primitive recreation opportunities would be foregone.

FEIS
MONTANA WILDERNESS
STUDY ACT AREAS

CHAPTER I
PURPOSE AND NEED FOR
THE PROPOSED ACTION

Overview

This chapter describes the legislative framework, planning process, general description, and issues of the Middle Fork Judith and Big Snowies Wilderness Study Areas.

Legislative Framework

MONTANA WILDERNESS STUDY ACT

On November 1, 1977, Congress passed the Montana Wilderness Study Act (Public Law 95-150). The Act requires the Secretary of Agriculture to study and make recommendations to Congress on the wilderness suitability of nine separate National Forest areas in Montana.

In the MWSA (Montana Wilderness Study Act), Congress specified that the nine areas be studied using the procedures in Section 3(b) and 3(d) of the Wilderness Act (Public Law 88-577). This procedure included:

- Determining suitability for wilderness preservation.
- Public notices and hearings.
- Notice to Governor of Montana, county governments, Federal Departments, and Agencies concerned.
- Sixty-day review period.
- Incorporate hearing and governmental agency and department comment in the report to Congress.

The nine MWSA areas are:

<u>MWSA Area</u>	<u>Acres</u>	<u>Forest</u>
Big Snowies	91,000	Lewis & Clark
Bluejoint	61,000	Bitterroot
Hyalite-Porcupine- Buffalo Horn	151,000	Gallatin
Middle Fork Judith	81,000	Lewis & Clark
Mount Henry	21,000	Kootenai
Sapphires	94,000	Bitterroot Deerlodge
Taylor-Hilgard	289,000	Beaverhead Gallatin
Ten Lakes	34,000	Kootenai
West Pioneer	151,000	Beaverhead
TOTAL	<u>973,000</u>	

RARE II

From June 1977 to January 1979 the Forest Service conducted the RARE II (Roadless Area Review and Evaluation) study. The purpose of RARE II was to inventory all roadless and undeveloped areas in the National Forest System and recommend the area's allocation to wilderness, further planning, or nonwilderness.

All of the MWSA areas were included in the RARE II process, and all were recommended for further planning. (Further planning means more information is needed before a wilderness or nonwilderness recommendation can be made.)

As a result of RARE II the boundaries of the Lewis and Clark's MWSA areas were expanded. The Big Snowies grew from 91,000 to 97,885 acres and the Middle Fork Judith from 81,000 to 92,000 acres.

Wilderness Study

In November 1979, the Regional Forester decided to conduct a Regional study of three of the MWSA areas, with the remaining six to be analyzed by the respective Forests. The Big Snowies and Middle Fork Judith were among the remaining six.

This environmental impact statement documents the analysis of the two MWSA areas on the Lewis and Clark National Forest, by disclosing the environmental consequences of implementing the proposed action and alternatives. The proposed action is the basis for the recommendation to Congress on the wilderness suitability of the Big Snowies and Middle Fork Judith Wilderness Study Areas.

Public workshops for the Big Snowies and Middle Fork Judith were held in central and western Montana. The issues and concerns voiced at these workshops, along with comments mailed in after the workshops, were used to develop the issue statements for this EIS. (See page 1-9) Hearings considering the result of the studies were held in Great Falls and Lewistown, Montana. Testimony given at the hearings will be part of the wilderness study report to Congress. (See Chapter VII)

Planning Process

Interdisciplinary Team

The interdisciplinary team is resource specialists drawn from physical, biological, and social sciences. The team considers problems collectively, rather than separating them along disciplinary lines. The interdisciplinary team used the public comments and existing laws and regulations to scope the issues and necessary analysis for this EIS. They analyze the effect of managing combinations of resources and weigh resource and dollar costs relative to benefits and uses provided. Interdisciplinary team members are in the List of Preparers, Chapter V. The same team prepared the Lewis and Clark Forest Plan and its EIS.

Planning Process

The interdisciplinary team's analysis followed the Forest planning process. The process is:

1. Identification of issues, concerns, and opportunities.
2. Development of planning criteria.
3. Inventory of data and information collection.
4. Analysis of the management situation.
5. Formulation of alternatives.
6. Estimated effects of alternatives.
7. Evaluation of alternatives.
8. Selection of the preferred alternative.
9. Implementation.
10. Monitoring and evaluation.

Remaining Process

This FEIS was prepared after completion of planning actions 1 through 7. As part of planning action 7, a DEIS was prepared for public review. Following the review period the team repeated steps 1 thru 7 as needed and this FEIS was prepared, filed with the Environmental Protection Agency, and made available to the public.

Congress has reserved the right to make final decisions on wilderness designation. Until Congress determines otherwise, the wilderness study areas will be managed subject to existing private rights and uses, to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System.

Planning Process

Planning Records

The Planning Records are referenced throughout the text. These documents record the detailed information and decisions used in developing the study report. They are available at the Forest Supervisor's office. Appendix A lists these planning records by title that are available on request.

Terms and Concepts

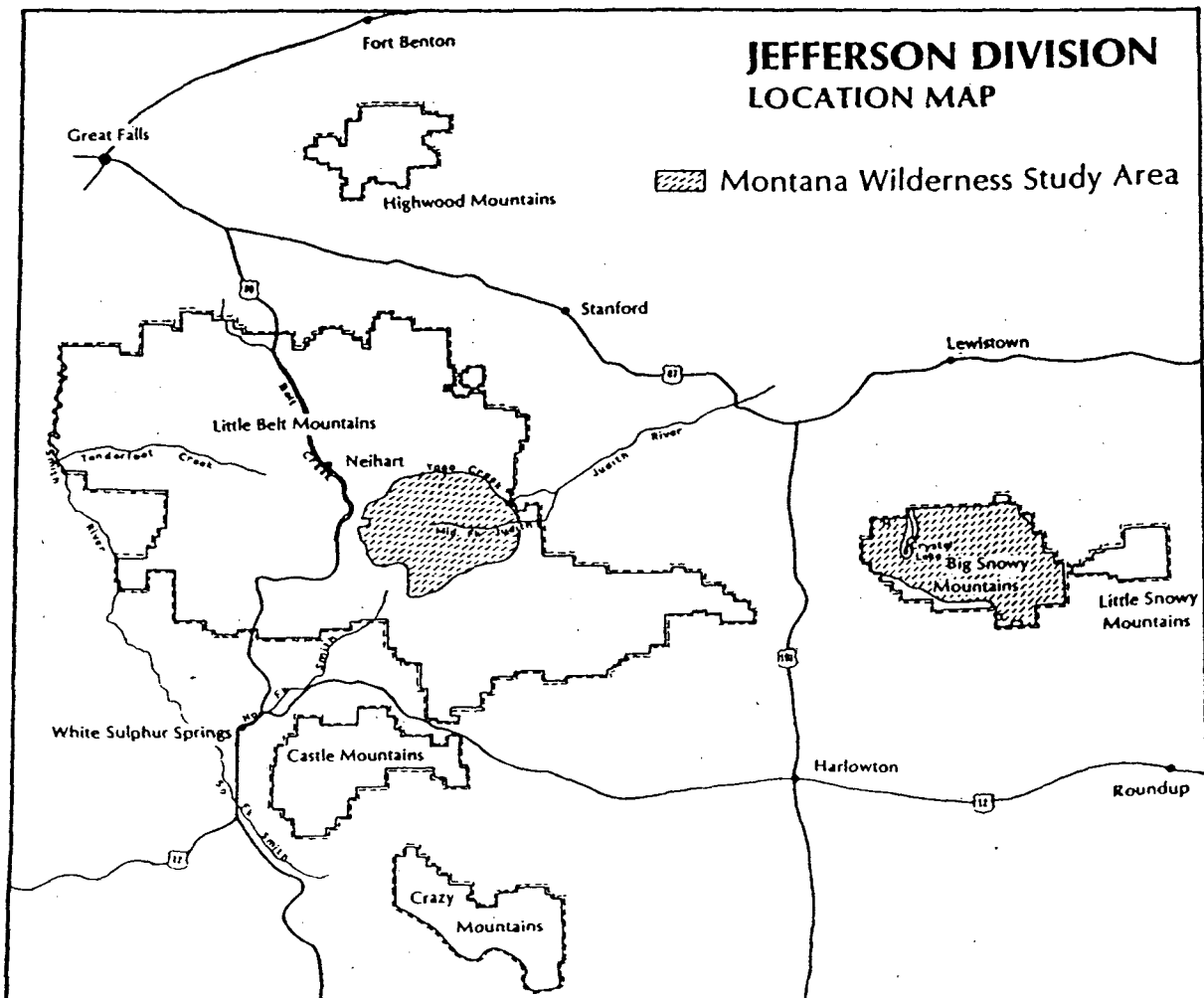
Many of the words and concepts in the study report require precise definition. The Glossary contains commonly used terms.

General Description

Jefferson Division

The Lewis and Clark National Forest is in north-central Montana within the upper Missouri River system. Historically, the Forest has been referred to by two major divisions.

The Jefferson Division lies east and south of Great Falls and is surrounded by private or other federal and state lands. The Jefferson Division, in Cascade, Chouteau, Judith Basin, Fergus, Golden Valley, Wheatland, Sweetgrass, Park, and Meagher Counties, has six distinct mountain ranges. The Crazy Mountains lie southwest of Harlowton. The north half is administered by the Lewis and Clark National Forest and the south half by the Gallatin National Forest. The other mountain ranges in this Division are: the Little Belt Mountains, southeast of Great Falls; Castle Mountains, southeast of White Sulphur Springs; Big Snowy and Little Snowy Mountains, south of Lewistown; and Highwood Mountains, east of Great Falls.



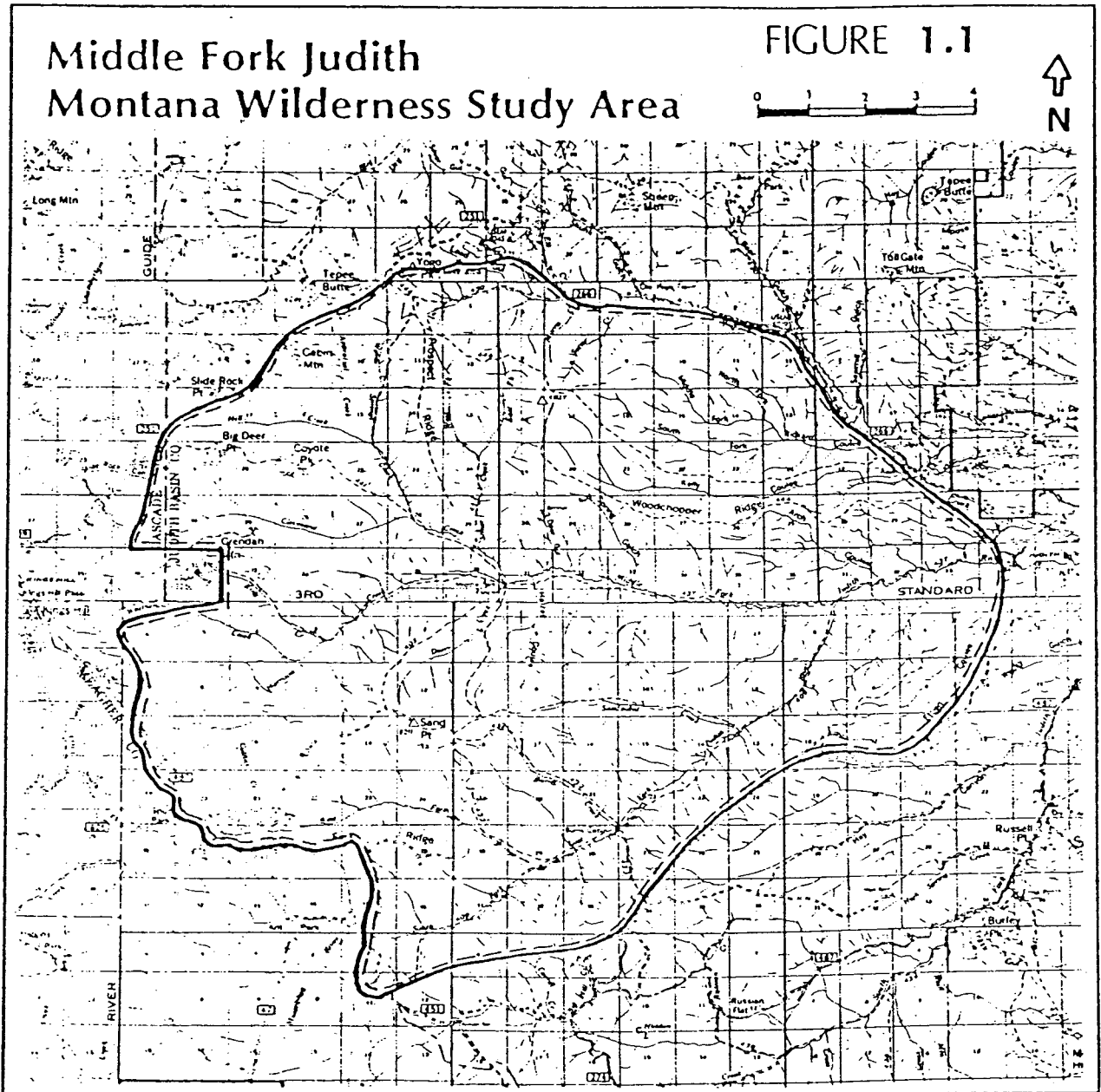
**MIDDLE FORK JUDITH -
GENERAL LOCATION**

The Middle Fork Judith Wilderness Study Area is in the Little Belt Mountains of central Montana, approximately 25 miles southwest of Stanford and 25 miles northeast of White Sulphur Springs. The area is mostly in Judith Basin County, with parts of the western edge in Meagher and Cascade Counties.

Originally composed of 81,000 acres, it was later expanded to 92,000 acres as a result of the RARE II study.

The Middle Fork Ranch, a 1,154 acre private in-holding, is in the center of the study area. Other small tracts of private land, totaling 194 acres are near the north and west boundaries.

The study area is bordered by National Forest land. However, state and private lands are less than a mile from parts of the eastern boundary. The state land includes the Judith Game Range, which is winter range for much of the elk herd found in the Middle Fork during spring, summer, and fall.



**BIG SNOWIES -
GENERAL LOCATION**

The Big Snowies Wilderness Study Area is in the Big Snowy Mountains of central Montana, approximately 18 miles south of Lewistown and 26 miles northeast of Harlowton. The area is in both Golden Valley and Fergus Counties.

Originally composed of 91,000 acres, the study area was expanded to 97,885 acres as a result of RARE II.

The Crystal Lake area approximately 2,000 acres paralleling Rock Creek drainage, in the northwestern part of the range, was not included in the study area. This area is developed for recreation including two trailheads, a boat ramp, a picnic area, a campground, a cabin, and a paved access road.

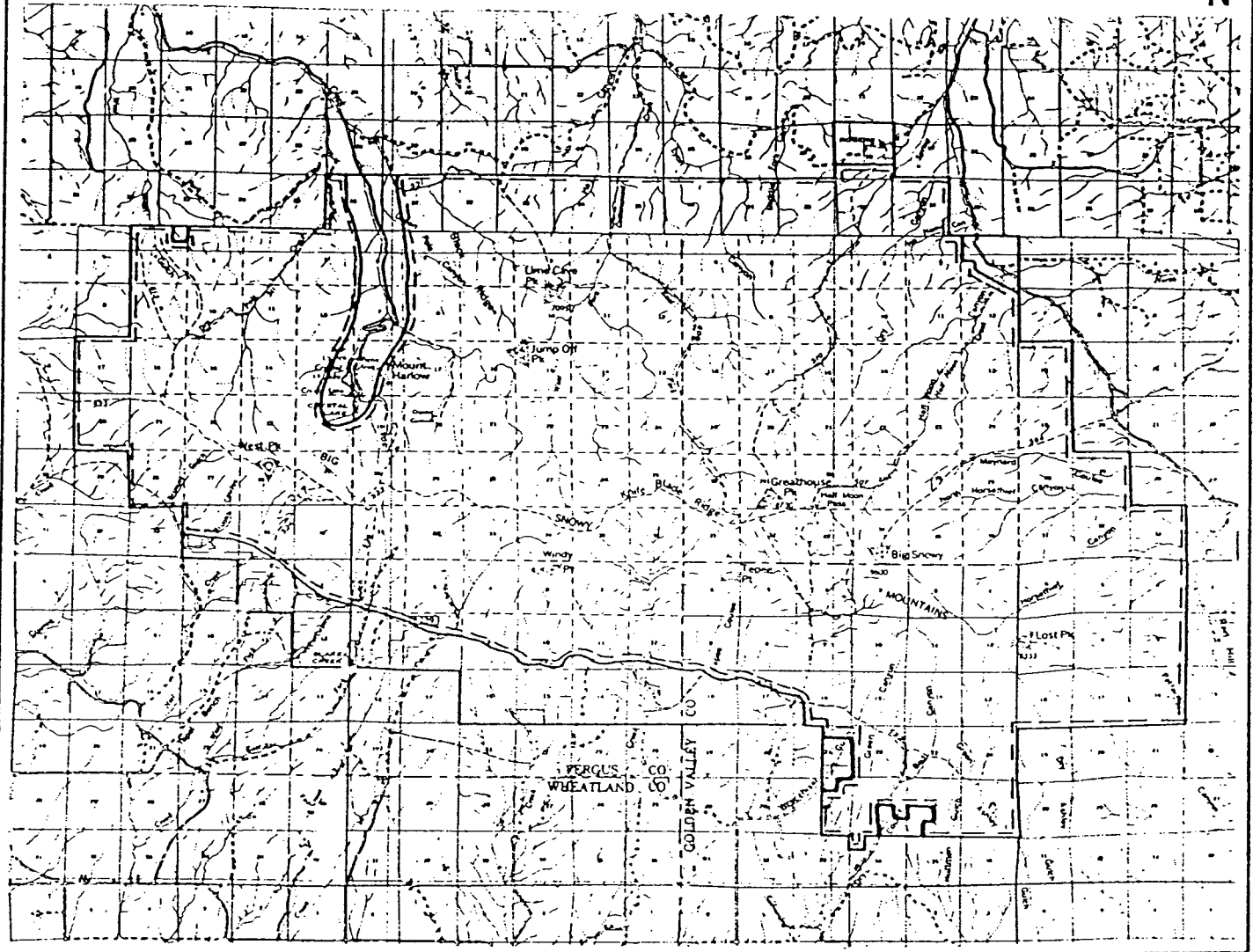
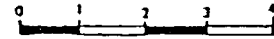
The study area is bordered by private and BLM (Bureau of Land Management) land. (See Figure 1.2) The BLM's Twin Coulees Unit is a 6,870 acre tract adjacent to the southeast corner. This heavily timbered, unroaded area is currently being studied by the BLM for wilderness classification in the Billings Resource Management Plan. The EIS for the Resource Management Plan recommends the Twin Coulee Unit for nonwilderness and resource development. (For a copy of the DEIS write: Bureau of Land Management, 222 North 32nd Street, P.O. Box 30157, Billings, MT 59107.)

Except for four other small BLM parcels on the north, west, and east, the remainder of the study area is bordered by private land.

The Little Snowy Mountains, which are Forest Service administered, are about five miles east of the study area.

Big Snowies Montana Wilderness Study Area

FIGURE 1.2



Issues

ISSUES

The interdisciplinary team reviewed the public comments, the laws and regulations for National Forest Management, and the MWSA to identify these issues for the Middle Fork Judith and Big Snowies Wilderness Study Areas.

Recreation

- What are the amounts and kinds of recreation opportunities the area currently supports or is capable of supporting?
- What are the current type and amount of motorized vehicle use and what is the potential for that use?
- How much need is there for the study areas to contribute to recreation opportunities for physically handicapped and elderly persons?

Visual Resources

- What esthetic values does the area contain and how should these values be protected?

Wilderness

- What are the wilderness attributes of the study areas and to what extent are they needed for wilderness?
- What considerations should be given to a diversified National Wilderness Preservation System when proposing lands for wilderness?
- What other Federal lands are classified, proposed or under study as wilderness in the surrounding area, and to what extent should they influence the classification of the study areas?

Wildlife

- What are the principle game, nongame, and threatened and endangered species, and what are the opportunities for habitat improvement?

Range

- What is the present range use of the areas and what is the potential for that use?

Timber

- What is the timber potential of the area and where is timber management appropriate?
- What are the present uses, locations, and opportunities for cutting household firewood?

Water and Soil

- What are the present conditions and uses of the areas' watershed, and what is its relative sensitivity to development activities?

- Minerals**
 - What are the hardrock, oil, and gas potentials of the area, and how should they be managed for that potential?
- Lands**
 - What are the present landownership pattern, current access, and use? What is the opportunity for acquisition or to manage private in-holdings?
 - What energy needs, such as powerline corridors, should be considered?
- Facilities**
 - What type, condition, and amount of road and trail access do the areas contain and what is the potential for road access?
- Protection**
 - What is the present condition and the potential for serious fire and/or insect and disease infestation? What are the current protection measures, and what measures are needed?
- Economic Efficiency**
 - How important are economic efficiencies and impacts in determining the level and location of resource development in the study areas?
- RPA**
 - What resources do the areas contain, and how should the study areas resource outputs be allocated toward meeting the RPA (Resource Planning Act) program goals?
- Human and Community Resources**
 - What considerations should be given to maintaining current employment levels for dependent communities?

Chapter II, Alternatives, describes each alternative in terms of resource outputs and costs. Outputs and costs are shown by resource as they relate to the issues.

Chapter III, The Affected Environment, describes the present and potential uses of the resources. Information analyzed in Chapters II and IV is the source of the environments described.

Chapter IV, Environmental Consequences, explains by alternative how the resources would be affected by the management activities.



A PACK TRIP INTO THE MWSA AREA.

FEIS
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CHAPTER II
ALTERNATIVE CONSIDERED

Overview

This chapter describes the alternatives for managing MWSA areas. It is divided into five parts:

- Alternative Formulation
- Alternative Description (Middle Fork Judith)
- Alternative Comparison (Middle Fork Judith)
- Alternative Description (Big Snowies)
- Alternative Comparison (Big Snowies)

Alternative Formulation describes the process used to formulate the alternatives. Alternative Description presents a narrative description of each of the alternative's management philosophy's. Descriptions of alternatives eliminated from detailed analysis are included in this part. Alternative Comparison displays the results and outputs of alternatives analyzed in detail. These results and outputs are presented in graphic and narrative form.

Alternative Formulation

ALTERNATIVE FORMULATION

Alternative formulation, Forest planning action 5, resulted from the four planning actions described below.

Planning Action 1 - Identification of Issues, Concerns, and Opportunities

Public issues and management opportunities were identified through public involvement and coordination with other Federal agencies, State agencies and local governments. Forest Service management concerns were added. These issues and concerns are listed in Chapter I. Details on the process used to develop issues, concerns, and opportunities are available in the planning record, "MWSA Workshop Analysis Summary."

Planning Action 2 - Development of Planning Criteria

Planning process and management criteria were established. The interdisciplinary team developed criteria for the inventory data collection, the management situation analysis, and the alternative formulation. Process criteria are documented in the planning record, "Proposed Criteria and Documentation."

Planning Action 3 - Inventory of Data and Information Collection

By using Forest resource inventories, a multi-resource data base was formed and stored in a computer retrieval system. A timber stand analysis specific to the MWSA areas was completed and used in the formulation of timber yield tables. Details of the data base content are in the planning record, "Data Base Components." Social and economic data for the counties directly affected by the Forest are in the planning record, "Social Impact Assessment Baseline, 1980."

Planning Action 4 - Analysis of the Management Situation

The Analysis of the Management Situation identified: (1) feasible ranges of goods, services, and uses; (2) projected use levels; (3) potential to resolve issues and concerns; and (4) the feasibility of providing the levels of goods, services, and uses resulting from assigned RPA objectives. This analysis identified the opportunity to change management direction and is documented in the planning record, "Analysis of the Management Situation." The Middle Fork Judith and Big Snowies MWSA areas were included in the analysis.

Planning Action 5 - Formulation of Alternatives

Alternatives list different ways to address and respond to the major public issues, management concerns, and resource opportunities. Alternatives result from planning actions 1 through 4 and are documented in the planning record, "Alternatives."

Alternative Formulation

MAJOR COMPONENTS USED TO FORMULATE ALTERNATIVES

Following completion of planning steps 1 through 4, the planning team began to develop alternatives. Major components of alternative formulation are explained below.

Analysis Areas

Using the Forest data base (see planning action 3), the planning team divided the Forest land into pieces with similar soils, vegetation, slope, and other biological and physical features. These pieces are called analysis areas. Each analysis area may be composed of many parts. Analysis areas which have the same costs and benefits for a given management practice were formed specific to the MWSA areas. For more information see the planning record, "Analysis Areas."

Management Prescriptions

Management prescriptions provide the basic building blocks for alternatives. The NFMA regulations define management prescriptions as sets of management practices applied to a specific area to attain multiple use and other goals and objectives. The management prescriptions are applied to the analysis areas by a resource allocation computer model called FORPLAN (see page 2-4).

For guidance in developing multiple resource management prescriptions, the interdisciplinary team reviewed the public issues and management concerns, used professional judgment, and followed existing policy and legal requirements. The prescriptions portray a broad range of management emphases, intensities, practices, standards, and guidelines.

Each prescription consists of (1) a goal statement describing the management emphasis, (2) statements of the desired future conditions of all resources, and (3) descriptions of the management practices, standards, and guidelines needed to achieve those desired future conditions, all oriented toward or compatible with the expressed goal of that prescription. The management standards and guidelines include the mitigation and resource coordination measures that are required by existing laws, regulations, and policies. Each management prescription has costs and benefits (in 1978 dollars) associated with the management practices.

Alternative Formulation

Allocation of Management Prescriptions

To fully explore appropriate, practical multiple-use Forest management, the interdisciplinary team developed a set of rules to guide management prescription assignments to analysis areas.

Foremost, the team based the prescription assignments on the land's inherent capability for resource production. For example, prescriptions with the management emphasis "improving big-game winter range" could be assigned only to areas identified as having winter range potential.

Given these rules and the limitations of the model, the team considered all the appropriate multiple-use management prescriptions for all the Forest.

For instance, an area might be considered capable of and suitable for either timber production, semi-primitive recreation, or wildlife management. At least three multiple-use management prescriptions are appropriate for that area. Under one alternative, the area would be allocated to a "timber management" prescription. Under another alternative, the same area could be allocated to a "semi-primitive recreation" prescription. If the area is allocated to semi-primitive recreation, no timber harvest would be scheduled. Under a third alternative, the "wildlife management" prescription could be applied. This prescription could harvest some timber along with wildlife improvement practices. The variations in lands allocated to different prescriptions is apparent in the acreage allocation summaries in Tables 2.1 and 2.6.

All management prescriptions and the rules for assigning them to analysis areas are listed in the planning record, "Management Prescriptions." All management practices are listed in the planning record, "Management Practices."

Forest management guidelines are documented in the planning record, "Management Guideline Analysis Report," and summarized in Chapter II of the Forest Plan.

Yield coefficients were developed for timber, recreation, range, wildlife, water, sediment, oil and gas, and local roads. Assumptions and methods of developing yield coefficients are available in the planning record, "Yield Coefficients."

Alternative Formulation

The Computer Model (FORPLAN)

The interdisciplinary team used a comprehensive resource allocation computer model called FORPLAN to (1) allocate management prescriptions to analysis areas and (2) schedule management prescriptions over time. A 150-year time period or "planning horizon" was used. The planning horizon was broken into 15 decades.

FORPLAN is a linear program that matches various combinations of prescriptions and schedules to achieve a specified goal. The FORPLAN analysis was conducted for each alternative. MWSA alternatives were evaluated within the alternatives for the Forest Plan and never for the MWSA areas alone. Using FORPLAN to evaluate the alternatives for MWSA along with the alternatives for the Forest Plan allowed the total impacts on all resources to be measured Forest-wide.

FORPLAN used an objective function of maximizing "present net value" to determine the most cost efficient allocation of and schedule for management prescriptions.* For further information, see the planning record, "Lewis and Clark FORPLAN Model."

The alternatives' resource objectives were entered in FORPLAN as constraints that required the model to produce varying amounts of resources and, in some situations, to provide certain land allocations. The FORPLAN model responded to these constraints by producing a mix of management prescriptions. At the same time, FORPLAN's goal was to have the highest possible "present net value" given the constraints.

The interdisciplinary team reviewed maps that showed how the alternatives, with constraints, would be implemented. If the interdisciplinary team felt implementation of any alternative was not feasible, the alternative was revised by varying the constraints. These alternatives were then rerun through FORPLAN to determine the new optimal mix of prescriptions and acres.

* Present net value is discussed further on page 2-5.

Alternative Formulation

HOW ECONOMICS WAS USED IN THE DEVELOPMENT OF ALTERNATIVES

First, costs and benefits were developed for each of the management prescriptions and used as the economic base data for FORPLAN.

Second, PNV (present net value) for each analysis area was determined for each management prescription and timing choice using FORPLAN. The PNV is the discounted value of all benefits with assigned or market dollar values minus the discounted costs.

Third, FORPLAN was then used to formulate alternatives with the PNV objective function, which ensures a cost efficient mix of prescriptions. Therefore, PNV was maximized for the 150-year planning horizon. A four percent discount rate was used in calculating PNV. This discount rate approximates the return on corporate long-range investments over and above the rate of inflation. In addition, a 7-1/8 percent discount rate was used to determine the sensitivity of alternatives to the discount rate.

The use of PNV as the FORPLAN objective function ensured compliance with NFMA regulations, which state:

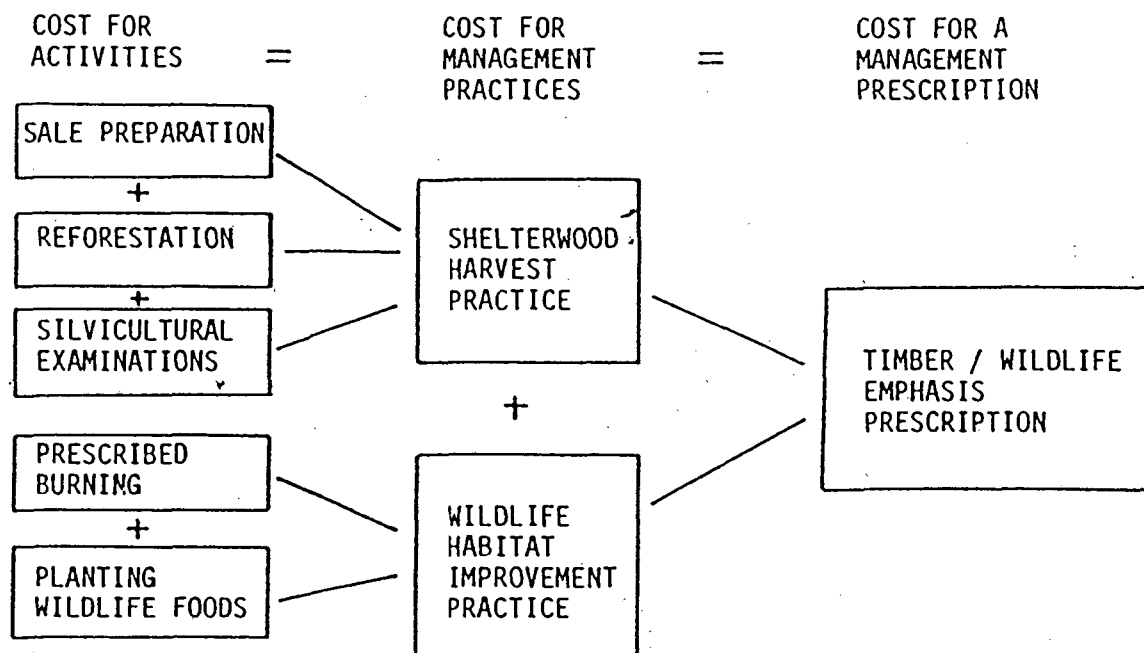
Each alternative will represent to the extent practicable the most cost-efficient combination of management practices established in the alternative.

Differences in PNV between alternatives are due to differences in the goals of each alternative. The goals of each alternative require a unique set of constraints be applied to the FORPLAN model.

Costs

Dollar costs and benefits were developed for the prescriptions. First, costs were assigned to management activities. Second, the activity costs were summed by management practices. Third, the cost of the management practices in each prescription were summed, which gave the total prescription cost.

Alternative Formulation



General administration, fire protection, and arterial and collector road costs were not included in the FORPLAN model. They were used in the PNV calculation.

Logging costs were the only costs assumed to increase in real terms during the first five decades.

Benefits

Dollar values were assigned to benefits from timber, range, recreation, and oil and gas leasing. Recreation benefits were not included in the FORPLAN model, but were included in the PNV calculation. The benefits assigned to each resource are as follows.

Alternative Formulation

-- Timber values represent the market value delivered at the mill. The value of timber at the mill, rather than average stumpage value, was used because site specific costs were estimated for all timber management and harvest activities, including both Forest Service and private operator costs. Timber values range from \$91.81 per thousand board feet (\$352.70 per thousand cubic feet) to \$440.80 per thousand board feet (\$1,732.39 per thousand cubic feet), depending on the species and diameter class. Timber values were assumed to increase in real terms during the first five decades, and thereafter remain constant.

-- Range values are the market values from studies done by Economic and Statistics Services, USDA. For this Forest, the value is \$11.69 per AUM (animal unit month).

-- Recreation values (willingness to pay) are non-market values from RPA estimates. Values for dispersed and developed recreation, wilderness recreation, and hunter recreation are \$3.00, \$8.00, and \$21.00 per RVD (recreation visitor day), respectively. Recreation values are assumed to increase in real dollars during the first five decades, and thereafter remain constant.

-- Oil and gas values are based on the annual lease rental rate, which is \$1.00 per acre per year for noncompetitive leases. No estimates were made on royalty returns because of the uncertainty involved.

For further information on costs, benefits, and projected real cost and value indices, see the planning record, "Economic Data and Analysis."

HOW NET PUBLIC BENEFITS WERE USED IN THE DEVELOPMENT OF ALTERNATIVES

Not all costs and benefits can be priced. The interdisciplinary team considered both priced and nonpriced costs and benefits during alternative formulation. The consideration of all costs and benefits is called "net public benefits" and represents the overall value to the nation of all benefits, less all costs, regardless of whether costs and benefits are expressed in priced or nonpriced terms.

Present net value represents the priced portion of net public benefits. An example of a nonpriced net public benefit is elk security habitat.

Alternative Formulation

Alternatives were formulated to examine the tradeoffs, such as reducing PNV (due to constraints on the spacial distribution of timber harvest on the Jefferson Division). Evaluation of these tradeoffs enables decisionmakers to select a preferred alternative that maximizes net public benefit.

The PNV component of net public benefit is discussed in the previous section. The nonpriced net public benefit components used in the alternative formulation process include:

- Elk hunting quality
- Semi-primitive recreation setting values

These nonpriced components were identified as significant by the public issues and management concerns.

CONSIDERING CHANGE FROM CURRENT DIRECTION

OPPORTUNITY FOR CHANGE

The MWSA directs that the Middle Fork Judith and Big Snowies be studied for possible inclusion into the National Wilderness Preservation System. As part of this study, the Analysis of the Management Situation for the Forest identified opportunities to change management direction for individual resources. Additional analysis was done for the Middle Fork Judith and Big Snowies Wilderness Study Areas. Currently the areas are managed to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System until Congress determines otherwise. The following resources were examined for the opportunity to change from current direction.

Dispersed Recreation

Recreation opportunity is the projected capacity of an area to provide recreation based on the area's recreation setting. Current available dispersed recreation opportunity is 28,000 RVDs (Recreation Visitor Days) in the Middle Fork Judith and 20,600 RVDs in the Big Snowies. Current use is 20,800 RVDs in the Middle Fork Judith and 5,700 RVDs in the Big Snowies.

The maximum available dispersed recreation opportunity is 333,100 RVDs in the Middle Fork and 163,100 RVDs in the Big Snowies. It would be attained by accessing undeveloped lands. This would cause a change in the recreation setting from semi-primitive to roaded natural. A roaded natural setting provides more dispersed recreation opportunity.

The least available dispersed recreation opportunity is 23,000 RVDs in the Middle Fork and 11,500 RVDs in the Big Snowies. This would occur under wilderness classification. Wilderness, by its nature, requires solitude and tranquility and takes place in a primitive recreation setting.

Wilderness

The maximum area in the two study areas which could be classified as wilderness is 189,885 acres.

Wildlife

The current elk population is 1,200 animals in the Middle Fork Judith and 100 animals in the Big Snowies. The maximum elk population for these areas cannot be determined because both areas contain little big game winter habitat and elk are highly dependent on the adjacent private, state, and other Federal land for winter habitat. Winter

Considering Change from Current Direction

habitat is the limiting factor for elk population in these areas. Without being assured of how the adjacent winter ranges will be managed, the maximum population can not be determined.

Range

The current domestic grazing level is 900 AUMs in the Middle Fork and 2,700 AUMs in the Big Snowies. Under maximum production, the Middle Fork could provide 1,500 AUMs and the Big Snowies could provide 3,700 AUMs.

Timber

The Middle Fork Judith has a standing volume of 460 million board feet. If all the available and capable lands were regulated for timber harvest and the rotation age was culmination of mean annual increment, 3.84 million board feet could be harvested each year.

The Big Snowies has a standing volume of 317 million board feet. If all the available and capable lands were regulated for timber harvest and the rotation age was culmination of mean annual increment, 3.41 million board feet could be harvested each year.

Minerals

Portions of the Middle Fork Judith have potential for hard rock minerals, which include silver, gold, copper, lead, zinc, and sapphires. There is low or no potential for oil and gas.

The Big Snowies have a low potential for hard rock minerals and recent seismic information shows the south side of the Snowies has potential for accumulation of oil and gas. A large portion of the study area is under application for oil and gas leases and the company is optimistic about the potential.

Alternative Description

ALTERNATIVES DEVELOPED

After completing the analysis of the management situation the alternatives were developed. Effort was concentrated in developing a reasonable range of alternatives that could be analyzed within the limits set by the capability of the Forest and that were responsive to public issues and management concerns.

Alternative Testing

Even within an alternative considered for detailed analysis, usually more than one way was used to accomplish the objectives of the alternative. Different ways to meet those objectives were reviewed and tested by the Forest management team, interdisciplinary team, and other Forest personnel, to ensure that the alternative met on-the-ground conditions and best fit the management objectives for the alternatives. Maximum PNV was used to test variations within alternatives to ensure economic efficiency.

Further information on all alternatives is on file at the Forest Supervisor's Office.

Alternative Description

Alternatives Eliminated from Detailed Study

**ALTERNATIVES ELIMINATED
FROM DETAILED STUDY**

The Forest developed and examined several alternatives which were eliminated from detailed analysis.

**Part Wilderness/
Part Other Management**

An alternative which would recommend the Middle Fork of the Judith as wilderness and would manage the Lost Fork for commodities was examined. This alternative was eliminated from detailed study because it substantially reduced the wilderness quality of the Middle Fork Judith with only a slight increase in commodity products.

An alternative which would manage the upper Middle Fork of the Judith for commodity products and would recommend the rest of the study area for wilderness classification was examined. This alternative was eliminated from detailed study because most of the effects, except for wilderness classification, are similar to Alternatives 6 and 7.

Boundary Changes

The boundary of each alternative was carefully examined to see if resource conflicts could be reduced and user opportunities increased.

The Middle Fork Judith contains 64 miles of primitive or low standard roads throughout the study area. Several areas are of known mineral interest. These could be excluded from the study area by minor boundary changes. There are 1,154 acres of private land in the middle of the study area. Three areas have been identified where human activities are readily apparent. Little opportunity is available to reduce resource conflict or increase user opportunity by modifying the boundary, with the exception of the mineral areas.

The Big Snowies contains 50 miles of low standard roads. These roads penetrate almost all major drainages. The opportunities for boundary changes are small and would not significantly affect resource outputs or uses.

**Special Management
Designations**

Using special management area designation under 36 CFR 294 was considered. This designation recognizes unique areas with outstanding attributes which should have some type of National designation. Neither the Middle Fork Judith nor Big Snowies are perceived to have these attributes.

Alternative Description

Alternatives Eliminated from Detailed Study

NFMA regulations, through the Forest planning process, provide the Regional Forester with the authority to establish management direction for all areas. This authority would be equal to special management designation.

**ALTERNATIVES
CONSIDERED IN DETAIL**

Following are the alternatives studied in detail. Pages 2-15 deal with the Middle Fork Judith and pages 2-59 deal with the Big Snowies.

Alternative 1

The Middle Fork Judith Wilderness Study Area would be managed for semi-primitive recreation and wildlife habitat, especially elk habitat, through improvement practices. (See Figure 2.1.)

Alternative 2

The Middle Fork Judith Wilderness Study Area would be recommended for wilderness classification. (See Figure 2.2.)

Alternative 3

The Middle Fork Judith Wilderness Study Area would be managed to provide a high level of commodity products, to meet the RPA Recommended Program. (See Figure 2.3.)

Alternative 4

The Middle Fork Judith Wilderness Study Area would be managed to provide a moderate level of commodity products. (See Figure 2.4.)

Alternative 5

The Middle Fork Judith Wilderness Study Area would be managed for a low level of commodity products. (See Figure 2.5.)

Alternative 6

The Upper Middle Fork Judith would be managed for commodity products; the remaining area would be managed for semi-primitive recreation and wildlife habitat. (See Figure 2.6.)

**Alternative 7
Preferred**

The Harrison Creek and Weatherwax drainages in the Upper Middle Fork would be managed for commodity products; the remaining area would be managed for semi-primitive recreation and wildlife habitat. (See Figure 2.7.)

The allocation of land management emphasis by alternative is shown in Table 2.1. A summary of resource outputs for the alternatives is shown in Table 2.2.

Figure 2.1.

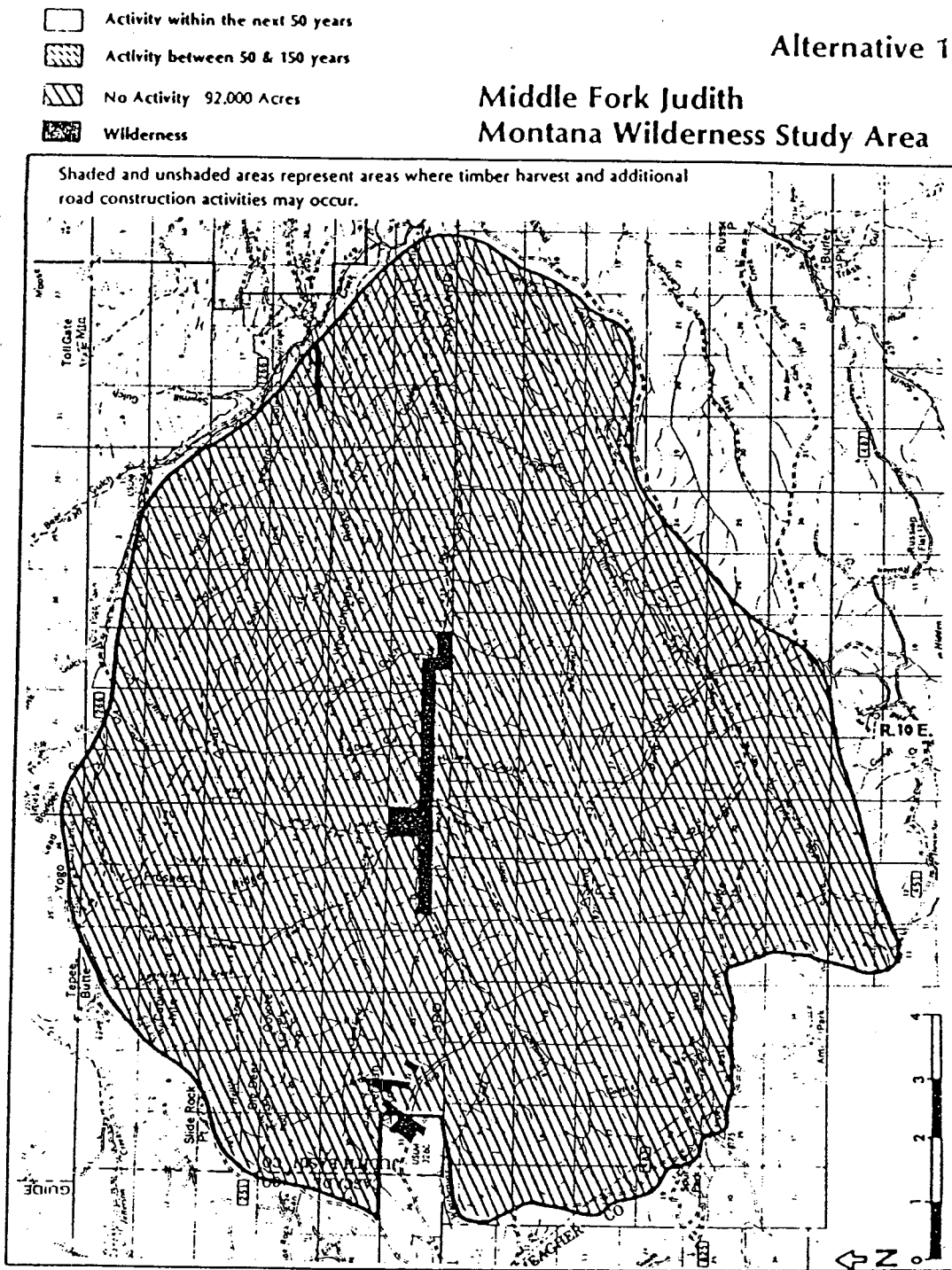






Figure 2.2.

-  Activity within the next 50 years
-  Activity between 50 & 150 years
-  No Activity
-  Wilderness 92,000 Acres

Alternative 2

Middle Fork Judith
Montana Wilderness Study Area

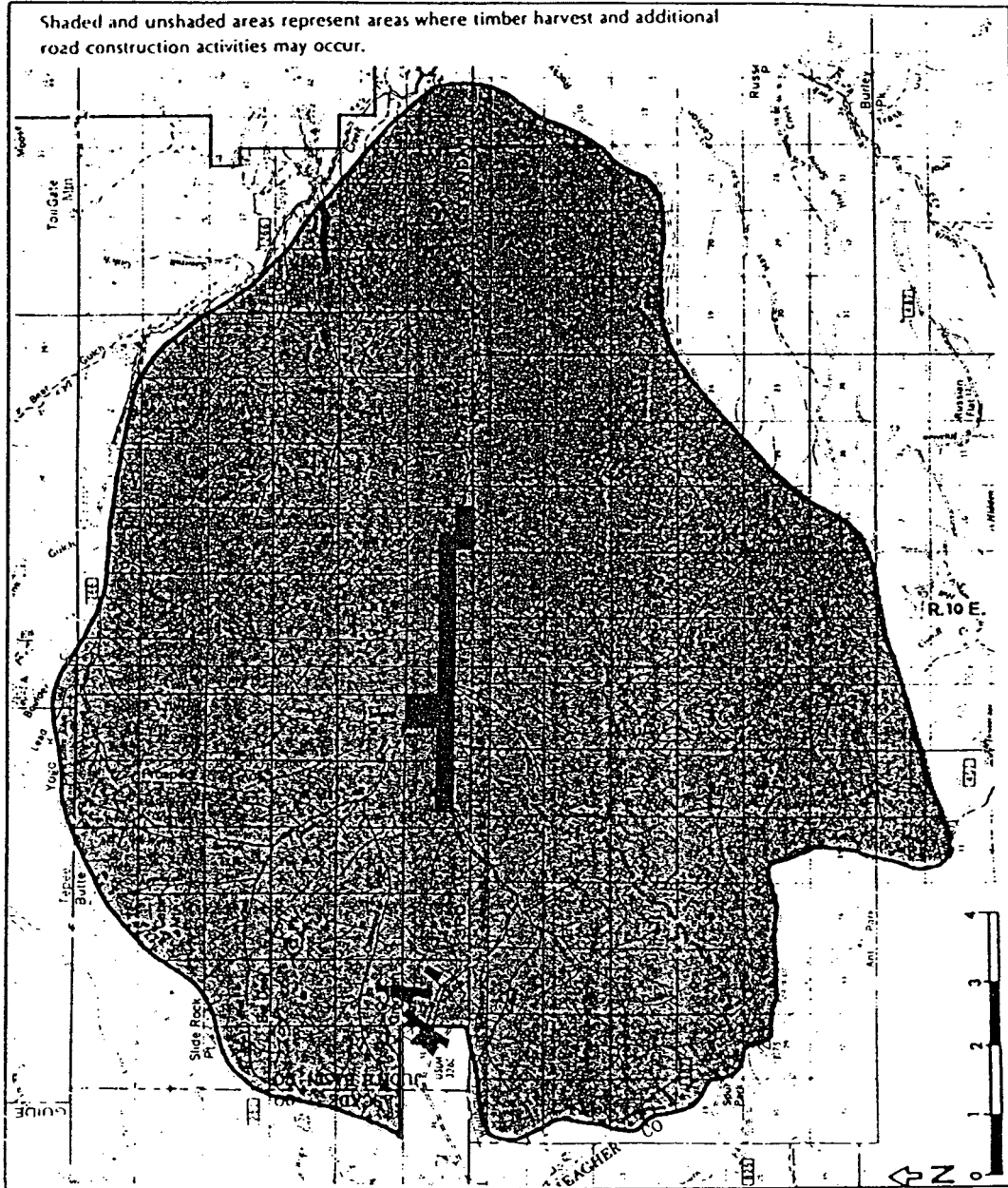


Figure 2.3.

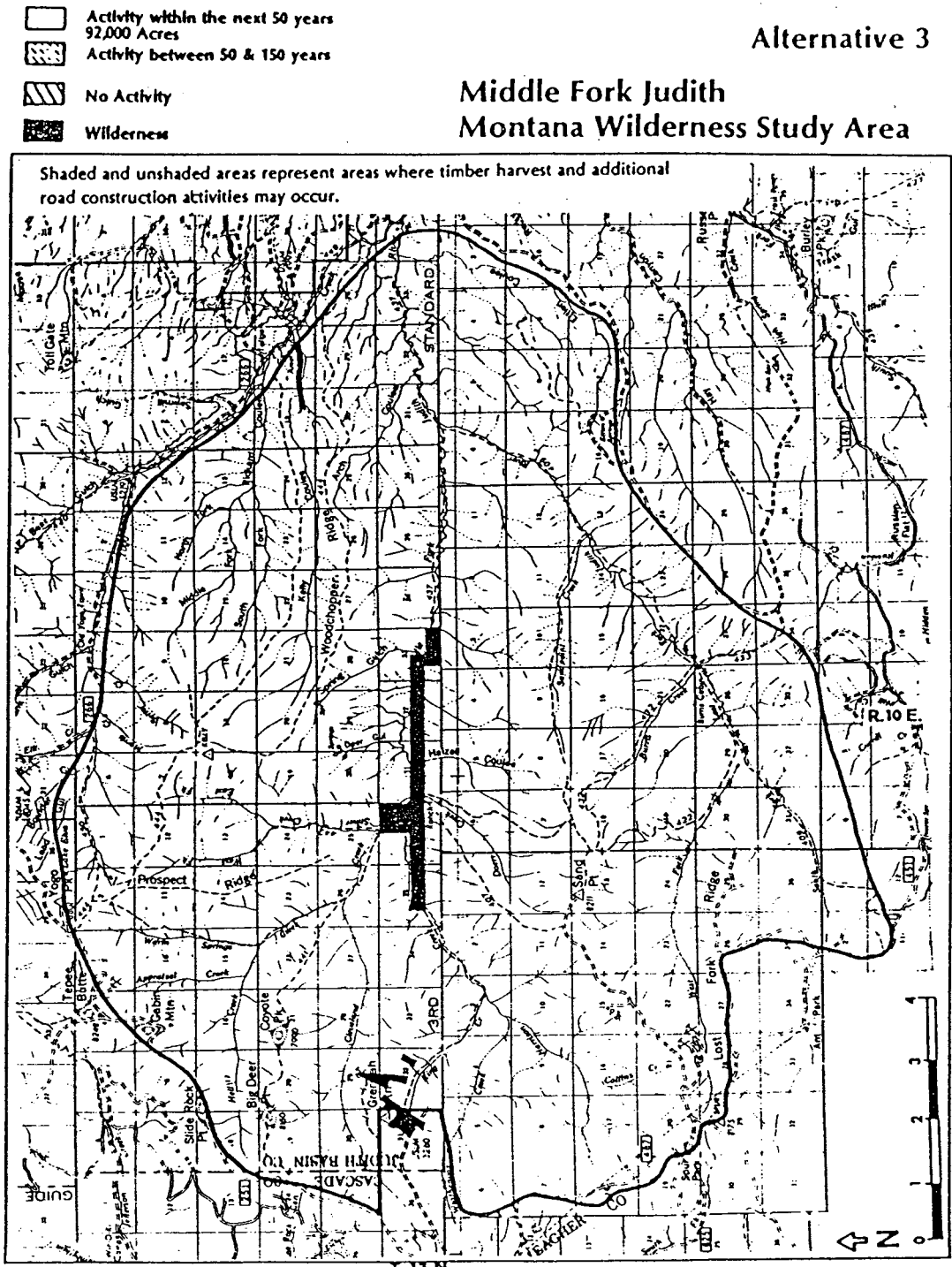


Figure 2.4.

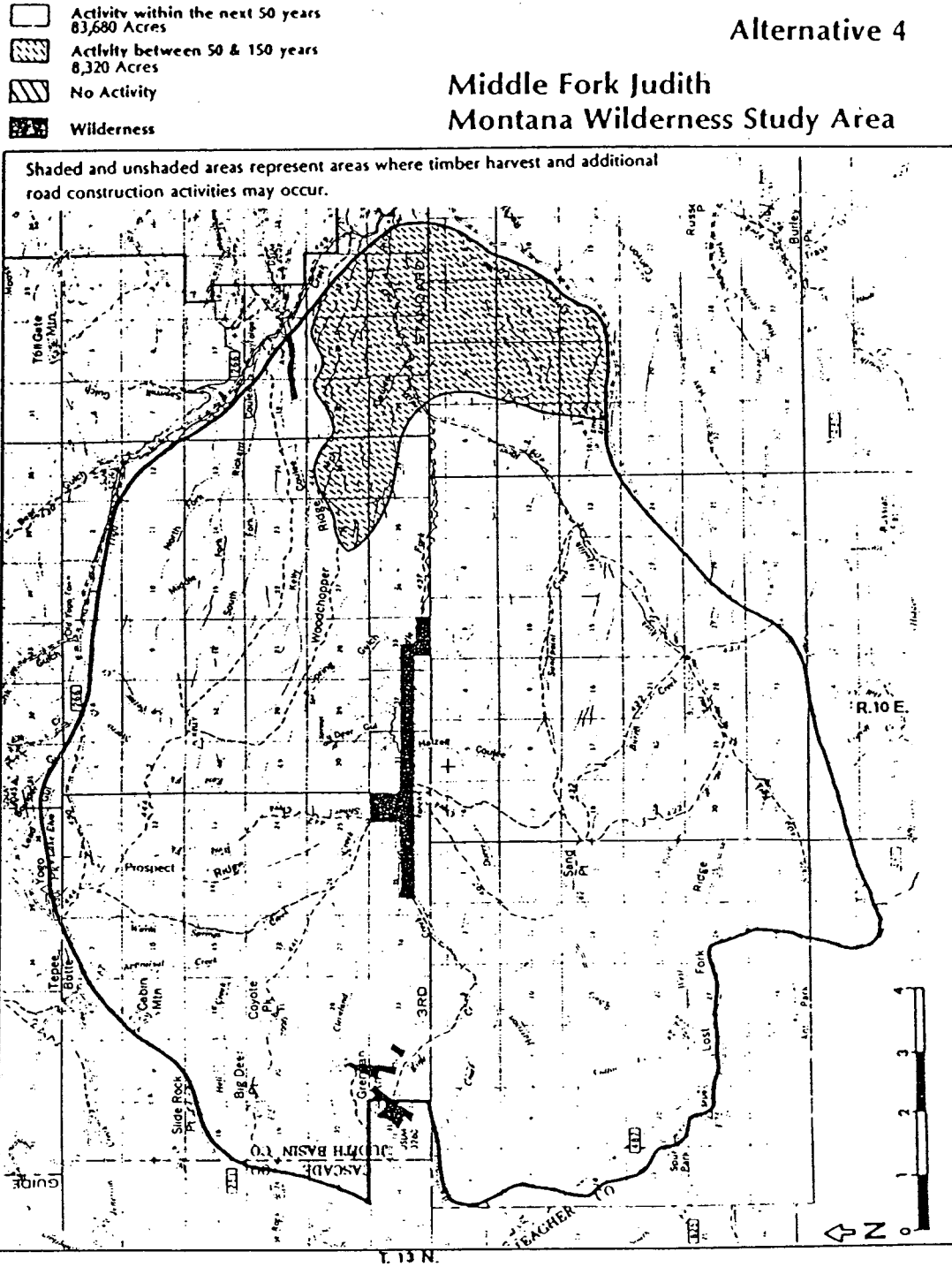


Figure 2.5.

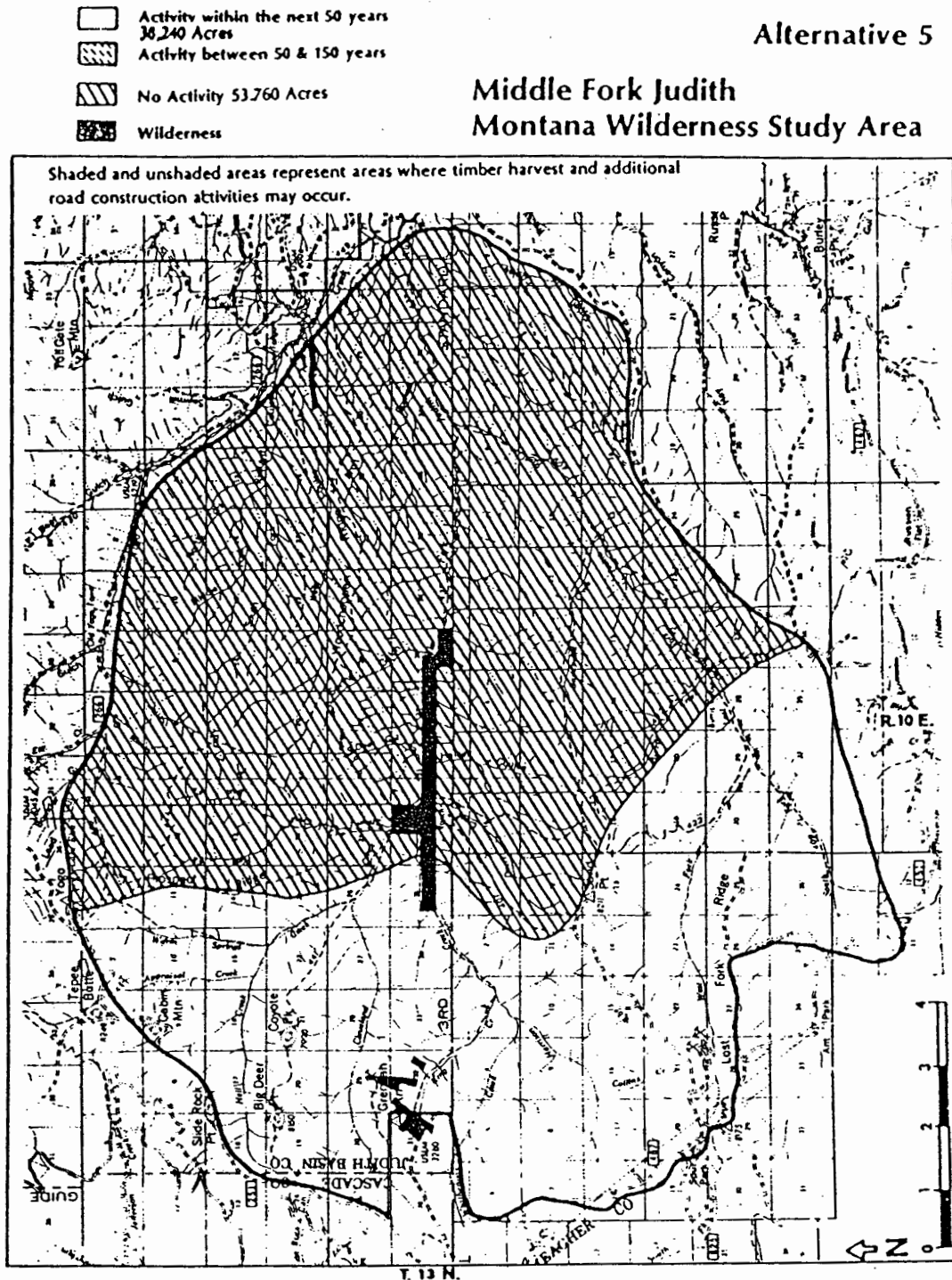


Figure 2.6.

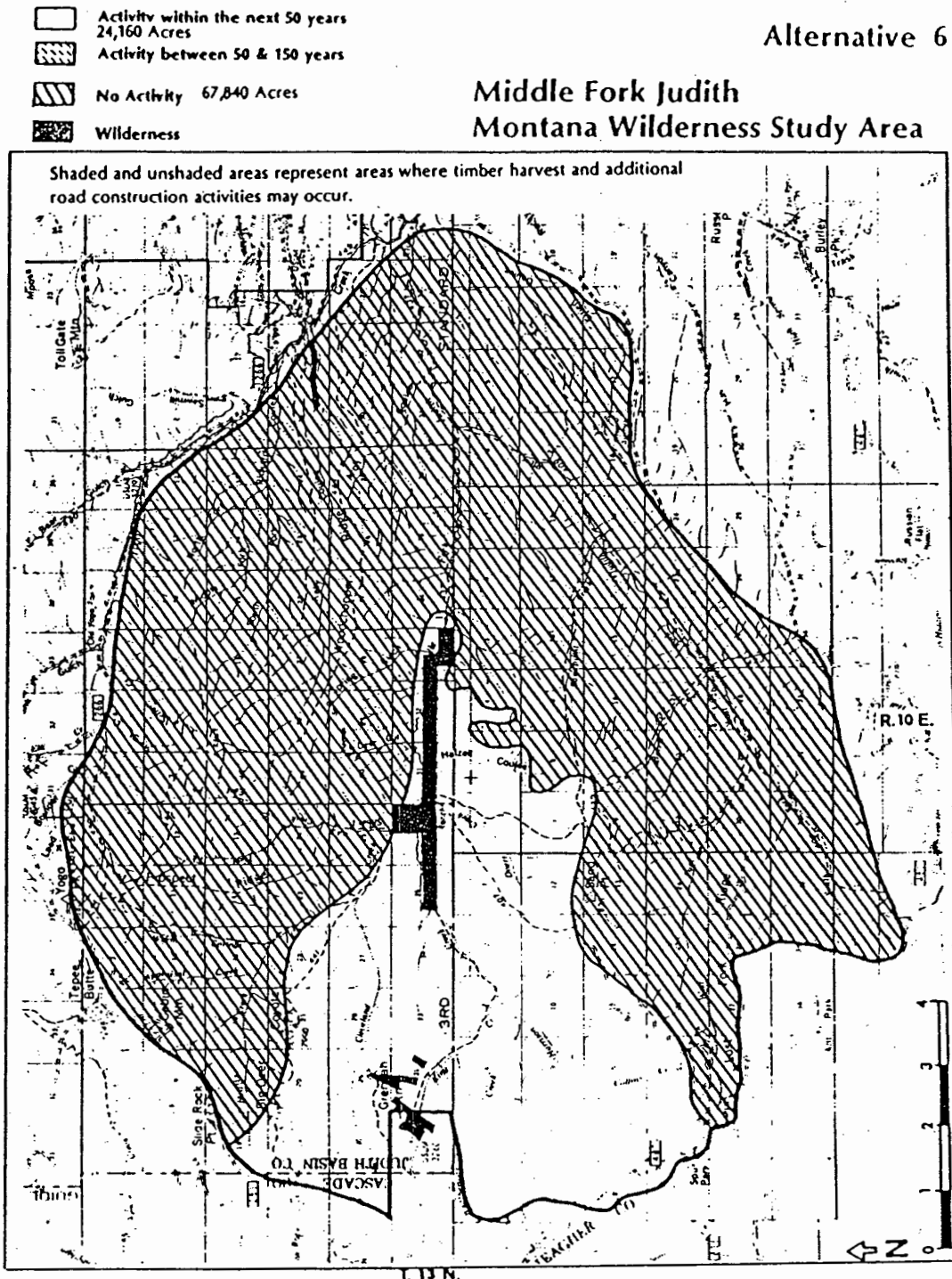


Figure 2.7.

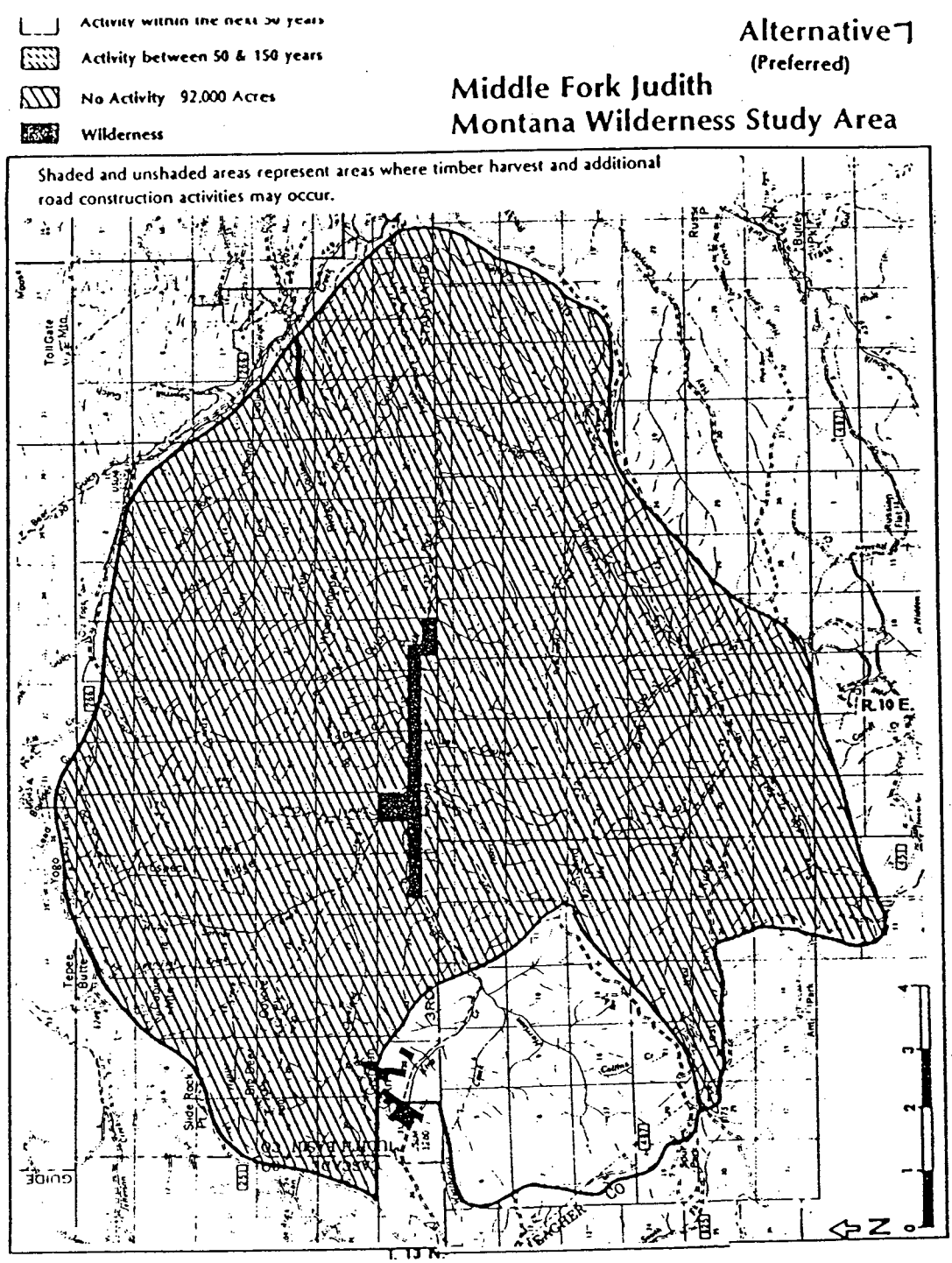


TABLE 2.1 Allocation of Acres to Management Emphasis by Alternative - Middle Fork Judith

	<u>Alt. 1</u>	<u>Alt. 2</u>	<u>Alt. 3</u>	<u>Alt. 4</u>	<u>Alt. 5</u>	<u>Alt. 6</u>	(Preferred) <u>Alt. 7</u>
Minimum Level Management	88140	0	33257	33570	83530	75696	78134
Range Management	2436	0	4980	6770	2525	981	981
Timber Management	0	0	40681	42876	910	10412	8810
Timber/Range Management	0	0	222	0	149	2064	2064
Timber/Wildlife/ Visual Management	0	0	11576	7363	4885	836	0
Wildlife Management	1424	0	1284	1421	0	2011	2011
Wilderness Management	0	92000	0	0	0	0	0

TABLE Summary of Total Resource Production by Alternative - Middle Fork Judith(Average Annual Output

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6	ALT-7 (Preferred)
<u>Recreation Use Potential</u> by 2030	Thousand RVDs							
(Base Year in Parentheses)								
- Primitive (0)		0	23.0	0	0	0	0	0
- Semi-Primitive (28.0)		28.0	0	0	2.7	15.7	21.1	24.5
- Roaded Natural Appearing (0)		0	0	333.1	303.3	138.5	87.2	42.0
<u>Recreation Setting</u> by 2030	Thousand Acres							
(Base Year in Parentheses)								
- Wilderness (0)		0	92.0	0	0	0	0	0
- Semi-Primitive (92.0)		92.0	0	0	8.3	53.8	67.8	80.4
- Roaded Natural Appearing (0)		0	0	92.0	83.7	38.2	24.2	11.6
<u>Visual Quality Objectives</u>	Acres							
- Preservation		0	92.0	0	0	0	0	0
- Partial Retention		92.0	0	0	8.3	53.8	67.8	80.4
- Modification		0	0	92.0	83.7	38.2	24.2	11.6
<u>Wildlife</u>								
- Habitat Improvement	Acre Equivalents							
-1982-1990		30	0	70	30	30	70	70
-2021-2030		30	0	100	30	30	70	70
- Elk Population Potential	Number							
-1982-1990		1200	1200	1200	1200	1200	1200	1200
-2021-2030		1200	1200	1120	1120	1180	1180	1200
- Elk Hunter Recreation	Hunter Days							
-1982-1990		8000	8000	7100	7700	7800	8000	8000
-2021-2030		8000	8000	4500	4300	7200	7300	7200
<u>Range</u>	AUMs							
- 1982-1990		900	900	900	900	900	900	900
- 2021-2030		900	900	980	940	980	940	940
<u>Timber</u>								
- Land Available, Capable, and Suitable	Acres	0	0	52.5	50.2	5.9	13.3	10.9

<u>RESOURCE USE AND DEVELOPMENT FACTORS</u>	<u>UNITS</u>	<u>ALT-1</u>	<u>ALT-2</u>	<u>ALT-3</u>	<u>ALT-4</u>	<u>ALT-5</u>	<u>ALT-6</u>	<u>ALT-7</u> (Preferred)
<u>Timber (Continued)</u>								
- Allowable Sale Quantity	Million Board Feet							
- 1982-1990		0	0	10.6	3.9	3.5	0	0
- 1991-2000		0	0	0	6.0	0	1.1	.7
- 2001-2010		0	0	7.8	12.1	2.3	1.1	.7
- 2011-2020		0	0	7.2	.5	0	.5	.7
- 2021-2030		0	0	2.7	4.5	.3	.5	.7
- Reforestation (Natural and Planting)	Acres							
- 1982-1990		0	0	1270	440	400	0	0
- 1991-2000		0	0	0	670	0	120	80
- 2001-2010		0	0	870	1350	260	120	80
- 2011-2020		0	0	800	60	0	60	80
- 2021-2030		0	0	300	500	40	60	80
<u>Roads</u>								
- Arterial and Collector to be constructed	Miles							
- 1982-1990		0	0	.9	.6	.6	0	0
- 1991-2000		0	0	0	.6	0	.6	0
- 2001-2010		0	0	.2	.2	.3	.3	0
- 2011-2020		0	0	.6	0	0	.2	0
- 2021-2030		0	0	0	0	.2	0	0
- Local	Miles							
- 1982-1990		0	0	13	4	4	0	0
- 1991-2000		0	0	0	7	0	1	1
- 2001-2010		0	0	9	14	3	1	1
- 2011-2020		0	0	8	1	0	1	1
- 2021-2030		0	0	3	5	1	1	0
<u>Prescribed burning</u>	Acres	10	0	70	30	40	50	50
	Wildlife	0	0	30	10	20	20	20
	Range	10	0	40	20	20	30	30
<u>Social/Economic</u>								
- Change in Employment	Person Years							
1982-1990		0	0	140	50	45	0	0
2021-2030		0	0	35	60	5	5	5

<u>RESOURCE USE AND DEVELOPMENT FACTORS</u>	<u>UNITS</u>	<u>ALT-1</u>	<u>ALT-2</u>	<u>ALT-3</u>	<u>ALT-4</u>	<u>ALT-5</u>	<u>ALT-6</u>	<u>ALT-7</u> (Preferred)
<u>Returns to U.S. Government</u> <u>1/</u>	Thousand							
- 1982-1990	Dollars	6.6	1.6	218.6	84.6	76.6	6.6	6.6
- 2021-2030		6.6	1.6	60.8	96.8	12.7	16.7	20.6
<u>Total Budget required to implement</u> <u>1/</u>	Thousand							
- 1982-1990	Dollars	72.3	62.4	286.4	166.0	166.0	141.6	72.4
- 2021-2030		72.3	62.4	124.1	158.4	242.7	78.4	85.7
<u>Present Net Value @ 4%</u> <u>1/</u>	Thousand	4858.8	5406.4	43302.8	37778.9	10550.7	7099.8	7513.7
	Dollars							

1/ Values given in 1978 dollars

**ALTERNATIVE
COMPARISON**

The alternative comparison shows how the alternatives are similar to and different from each other. Focus is on the public issues and management concerns (listed in Chapter I) and how the alternatives address these issues and concerns. The comparison is organized by resource, such as timber or range. The Middle Fork Judith Study Area is discussed first, followed by the Big Snowies Study Area.

Alternative 1

Alternative 1 would maintain the Middle Fork Judith Wilderness Study Area much like it is today. The area would remain undeveloped and timber would not be harvested on a regulated basis. Both motorized and nonmotorized semi-primitive recreation opportunities would be provided. Game and nongame wildlife habitat would not change. Elk and elk hunting opportunities would not change.

Alternative 2

Alternative 2 would recommend wilderness classification for the Middle Fork Judith Wilderness Study Area. Wilderness designation would result in the area being managed to leave it unimpaired for future generations' use and enjoyment. Timber and motorized recreation opportunities would be foregone.

Alternative 3

Alternative 3 would provide the highest levels of timber and range outputs. All of the study area would be developed. Although elk numbers would only decrease slightly, hunting recreation would be substantially reduced. Wildlife habitat would change and most habitat improvement would be directed at mitigating the effects of other programs.

Alternative 4

Like Alternative 3, Alternative 4 would also provide high levels of timber and range outputs. About 90 percent of the study area would be developed. Elk numbers would decrease slightly and hunting recreation would be substantially reduced. Most wildlife habitat improvement would be directed at mitigating other programs.

Alternative 5

Alternative 5 would provide moderate levels of timber and range outputs. About 40 percent of the study area would be developed. Hunting recreation would decrease although there would be only a small decrease in elk numbers. The lower canyon area would provide semi-primitive recreation opportunities.

Alternative 6

Alternative 6 would provide a low level of timber and a moderate level of range outputs. About 25 percent of the area would be developed. Both roaded natural and semi-primitive recreation opportunities would be provided. Elk populations and hunting opportunity would decrease slightly.

**Alternative 7
Preferred**

Alternative 7 would provide a low level of timber in the Harrison Creek and Weatherwax drainages and a moderate level of range outputs. About 10 percent of the area would be developed. Both roaded natural and semiprimitive recreation opportunity would be maintained, because new roads would be closed to protect game habitat and maintain hunting quality.

RECREATION

Current available dispersed recreation opportunity is 28,000 RVDs of semi-primitive recreation in the Middle Fork Judith Study Area. Current use is about 10,800 RVDs semi-primitive, nonmotorized recreation and 10,000 RVDs of motorized recreation. There are four outfitters under special-use permit who use the Middle Fork for hunting. The study area contains no specific facilities for the elderly or handicapped.

Issues

- What are the amounts and kinds of recreation opportunities the area presently supports or is capable of supporting?
- What are the current type and amount of motorized vehicle use and what is the potential for that use?
- How much need is there for the study area to contribute to recreation opportunities for physically handicapped and elderly persons?

Comparison

Figures 2.8 and 2.9 display the projected dispersed recreation opportunity and recreation setting, in 2030, by alternative.

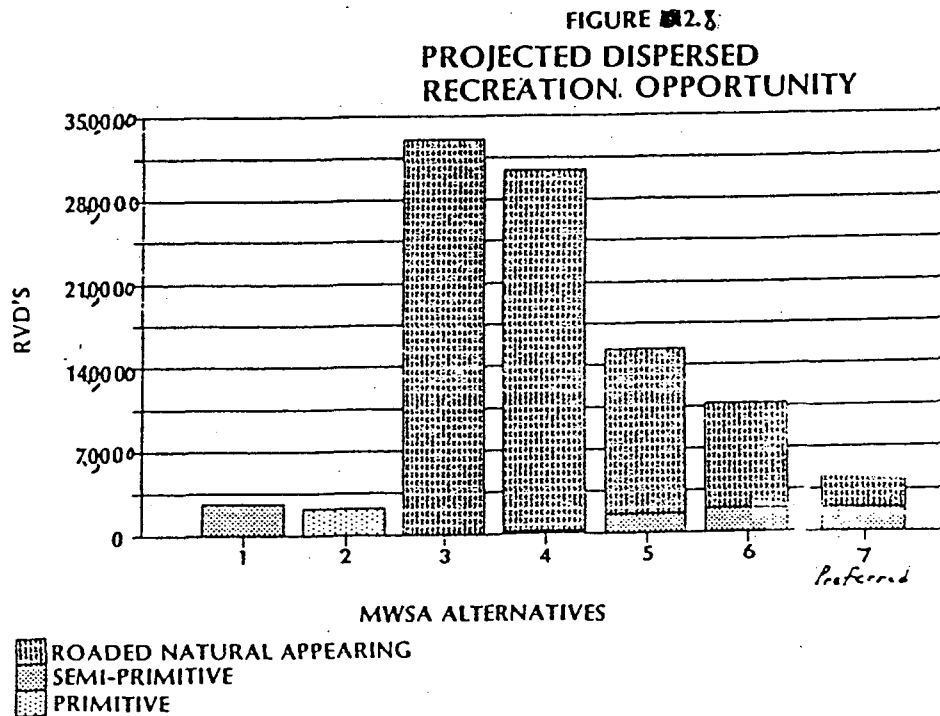
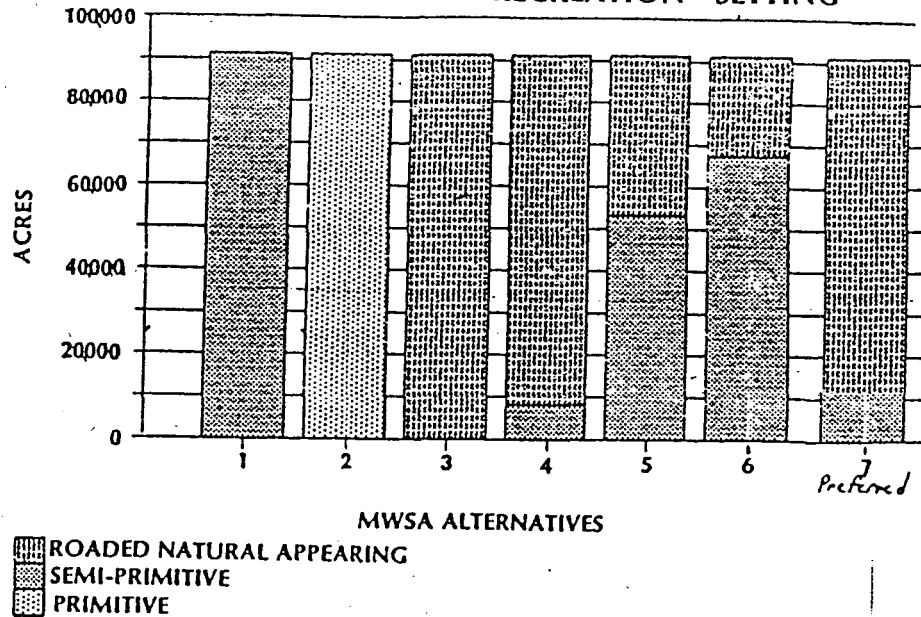


FIGURE 2.4.9
PROJECTED DISPERSED
RECREATION SETTING



Alternative 1

The Middle Fork Judith Study Area would provide about 28,000 RVDs (92,000 acres) of semi-primitive motorized and nonmotorized recreation. The hunting quality for individuals and outfitters would be maintained.

Alternative 2

The area would provide 23,000 RVDs (92,000 acres) of primitive recreation (wilderness) opportunity. Under wilderness classification the area would be closed to motorized vehicles. The hunting quality for individuals and outfitters would be maintained.

Alternatives 3, 4, & 5

As areas would be roaded, the recreation setting would change to roaded natural and use levels would increase. By 2030, Alternative 3 would provide 333,100 RVDs (92,000 acres) of roaded natural recreation opportunity. Alternative 4 would provide 303,000 RVDs (83,700 acres) of roaded natural recreation and 2,100 RVDs (8,300 acres) of semi-primitive recreation opportunities. Alternative 5 would provide 138,500 RVDs (38,200 acres) of roaded natural recreation and 13,600 RVDs (53,800 acres) of semi-primitive recreation opportunity. The hunting quality for individuals

and outfitters would decrease as the recreation setting becomes more roaded natural.

Alternative 6

By 2030, Alternative 6 would provide 87,200 RVDs (24,200 acres) of roaded natural recreation opportunity and 17,200 RVDs (67,800 acres) of semi-primitive recreation opportunity.

**Alternative 7
Preferred**

By 2030, Alternative 7 would provide 42,000 RVDs (11,600 acres) of roaded natural recreation opportunity and 24,500 RVDs (80,400 acres) of semi-primitive recreation opportunity. The hunting quality for individuals and outfitters would decrease. However, roads to access surface resources will be gated.

VISUAL RESOURCES

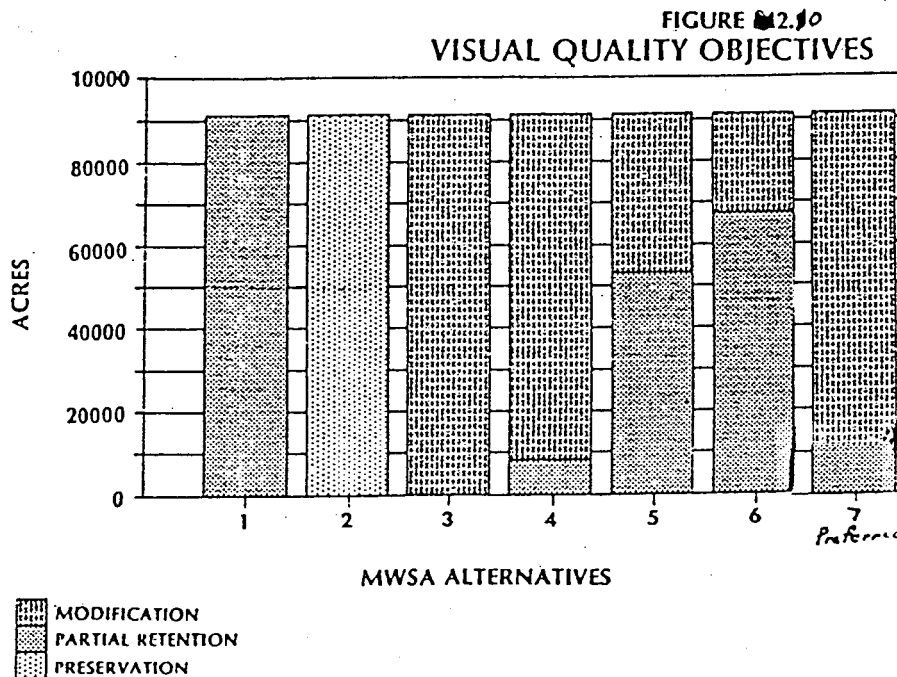
The Middle Fork Judith Study Area is mostly a natural environment. The topography is varied and scenic. It is rolling and gentle in some areas and rugged in others. Changes in the natural landscape are reflected by the acres managed in a partially retention or modification setting.

Issues

- What esthetic value does the area contain and how should these values be protected?

Comparison

Figure 2.10 shows the acres in each of the visual management objectives: preservation, partial retention, and modification.



Alternative 1	The Middle Fork Judith Study Area would be managed to maintain the natural landscape of the area.
Alternative 2	Recommended wilderness classification would preserve the natural landscape of the study area.
Alternative 3	The natural landscape on all 92,000 acres would be modified.
Alternative 4	The natural landscape would be retained on 8,320 acres and modified on 83,680 acres.
Alternative 5	The natural landscape would be retained on 53,760 acres and modified on 38,240 acres.
Alternative 6	The natural landscape would be retained on 67,840 acres and modified on 24,160 acres.
Alternative 7 Preferred	The natural landscape would be retained on 80,400 acres and modified on 11,600 acres.

CULTURAL RESOURCES

Cultural resources are managed under the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the Archaeological and Historical Conservation Act of 1974, and the Archaeological Resource Protection Act of 1979.

Alternative 1 & 2

These alternatives would possess no development. The potential risk of damage to cultural resources would be slight.

Alternative 3

Generally, the risk of damage to cultural resources increases with development and access, so this alternative would possess the greatest risk to the cultural resources. Project work would continue to require inventory of sites and implementation of appropriate mitigating measures.

**Alternatives 4, 5, 6,
& 7 - Preferred**

These alternatives would have moderate development. Areas allocated to intensive management activities would have the greatest risk. Project inventory and evaluation would continue.

WILDERNESS

National Forest System Wilderness is managed under the Wilderness Act of 1964 and CFR 36 Part 293 (Wilderness and Primitive Areas). Wilderness study areas are managed to protect their wilderness character until Congress decides on their classification.

Issues

- What are the wilderness attributes of the study area, and to what extent are they needed for wilderness?

- What considerations should be given to a diversified National Wilderness Preservation System when proposing lands for wilderness?

- What other Federal lands are classified or proposed as wilderness or are under study as wilderness in the surrounding area, and to what extent should they influence the classification of the study areas?

WARS

Wilderness quality is reflected by the WARS (Wilderness Attribute Rating System). The 28-point rating system evaluates the area on natural integrity, apparent naturalness, solitude opportunity, and primitive recreation setting. Middle Fork Judith received a rating of 22 under this system. This rating reflects the disruption of natural integrity and lack of opportunities for solitude because of primitive roads throughout the area.

**Unique Ecosystem
& Wildlife Species**

In the RARE II analysis, the Middle Fork Judith was not selected to fill a target for ecosystem or wilderness associated wildlife species representation.

**Relationship to Other
Wilderness Areas**

Within 250 miles of the Middle Fork Judith Study Area are 2.8 million acres of classified wilderness. There are also several areas which are being studied for possible wilderness classification by the Forest Service and Bureau of Land Management. The Middle Fork Judith would provide weekend visitation opportunities from the population centers of Great Falls, Lewistown, and Helena.

Comparison

Table 2.2 displays the acres of recommended wilderness and the recreation opportunity, by alternative. Recreation opportunity is primitive within classified wilderness.

Alternative 1	The Middle Fork Judith would be managed as a wilderness study area. The area's character would be protected.
Alternative 2	Wilderness classification would add 92,000 acres to the National Wilderness Preservation System.
Alternative 3	The opportunity for wilderness classification would be foregone on all 92,000 acres.
Alternative 4	The opportunity for wilderness classification would be foregone on 83,680 acres. The opportunity would be retained on 8,320 acres.
Alternative 5	The opportunity for wilderness classification would be retained on 53,760 acres. The opportunity for wilderness classification would be foregone on 38,240 acres.
Alternative 6	The opportunity for wilderness classification would be retained on 67,840 acres. The opportunity for wilderness classification would be foregone on 24,160 acres.
Alternative 7 Preferred	The opportunity for wilderness classification would be retained on 11,600 acres and foregone on 80,400 acres.

WILDLIFE AND FISH

A variety of wildlife use the Middle Fork Judith Study Area. The study area provides habitat for elk, mule deer, grouse, and black bear. Limited numbers of white-tailed deer and mountain lion are in portions of the area. Nongame species include wolverine, lynx, golden eagle, and prairie falcon. The Middle Fork and its main tributaries provide over 29 miles of fisheries for cutthroat and rainbow trout.

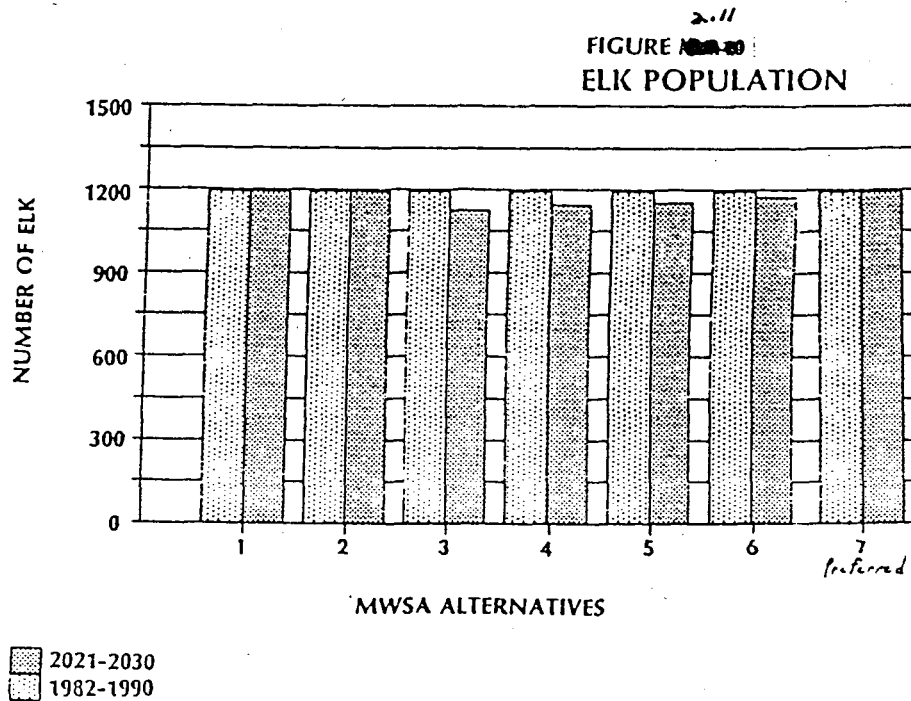
Opportunities are available to maintain or improve spring/fall ranges for elk and mule deer at lower elevations in the eastern portion of the area. Some limited opportunities for fish habitat improvement also exist on the larger streams.

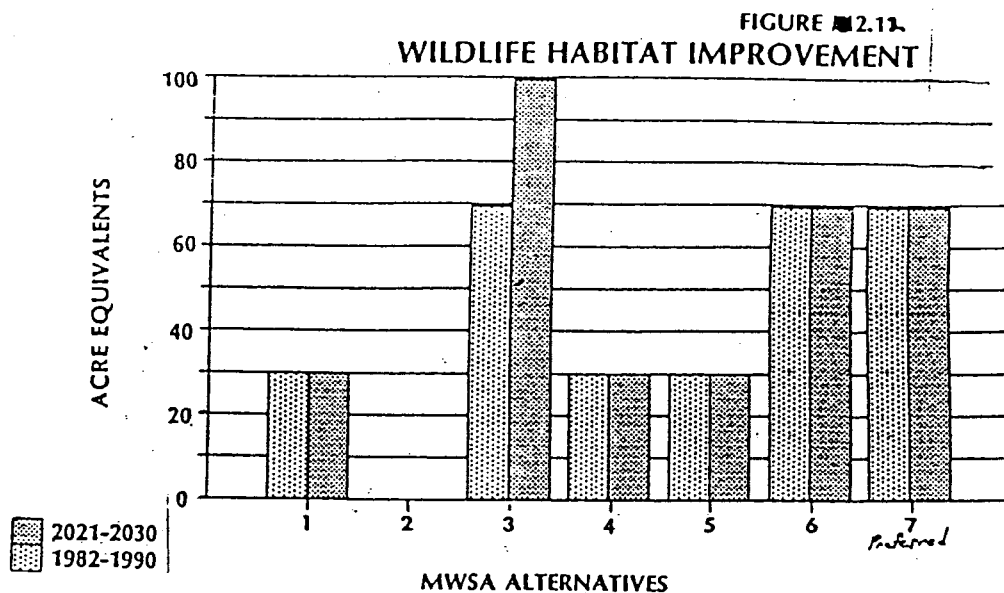
Issues

- What are the principle game, nongame, and threatened and endangered species, and what are the opportunities for habitat improvement?

Comparison

Figures 2.11 and 2.12 display elk populations and wildlife habitat improvements for the first and fifth decades by alternative.





Alternative 1

This alternative would favor animals that prefer late successional vegetation. Security habitat for elk would be maintained. Elk population levels and hunting opportunities would not change. Fire and other vegetative manipulation would be used to improve spring and fall elk habitat. These areas would be used by animals that prefer early successional vegetation.

Alternative 2

Native wildlife species and their habitat are an integral part of the wilderness resource. Management of wildlife and wildlife habitat would be secondary to management of the wilderness resource. Wilderness classification tends to favor animals that prefer late successional vegetation. Elk population levels and hunting opportunity would not change.

Alternative 3

This alternative would favor animals that prefer early successional vegetation. Security habitat for elk would be substantially reduced and the population would decrease by 170 animals. This decrease may be partially offset by road closures. Hunting opportunity would decrease. Elk migration routes to the Judith Game Range (adjacent to part of the eastern boundary of the Middle Fork Judith)

may be disrupted. This may shift wintering elk on to other adjacent private lands.

Alternative 4

This alternative would provide habitat for animals that prefer early and late successional vegetation. Elk population would decrease by 50 animals. Hunting opportunity would decrease.

Alternative 5

This alternative would favor animals that prefer late successional vegetation. Elk security habitat would be reduced on 8,320 acres. The elk population would decrease by 40 animals. Hunting opportunity would decrease slightly.

Alternative 6

This alternative would provide security habitat for elk in the Lost Fork, Woodchopper Ridge, and lower Middle Fork of the Judith. These areas would be used by animals that prefer late successional vegetation. Elk security areas in the upper Middle Fork would be reduced. Elk populations would decrease by 20 animals. Hunting opportunity would decrease slightly. This may be partially offset by road management.

The upper Middle Fork would provide habitat for animals that prefer early successional vegetation. Fire and other vegetation manipulation would be used to improve spring and fall elk habitat.

**Alternative 7
Preferred**

Security habitat for elk in the Lost Fork, Woodchopper Ridge, Clearland Creek, and lower Middle Fork of the Judith would be maintained. Elk populations would be maintained. Hunting opportunity would decrease slightly. But closing roads to the public would help maintain wildlife habitat.

The upper Middle Fork would provide habitat for animals that prefer early successional vegetation. Prescribed fire and other vegetation manipulation would be used to improve spring and fall habitat.

RANGE

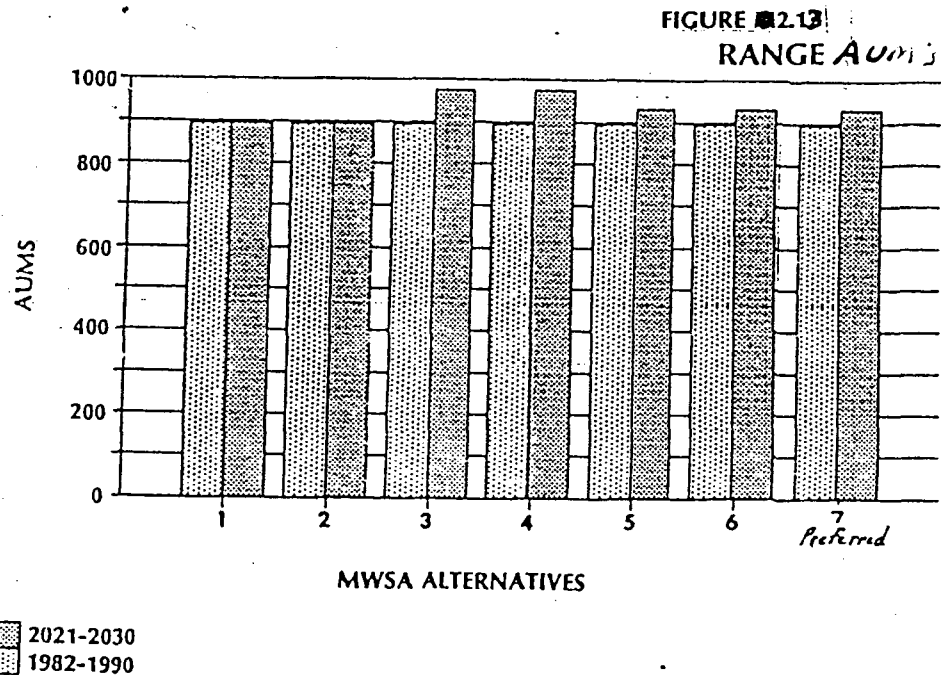
The study area contains approximately 9,800 acres of suitable livestock range. Currently, 900 animal unit months (AUMs) of livestock grazing are permitted. The forage in the study area plays an important part in supplementing local ranch operations, as well as providing feed for big game animals, particularly elk.

Issues

- What is the present range use of the areas, and what is the potential for that use?

Comparison

Figure 2.13 displays the number of AUMs for livestock grazing for the first and fifth decades, by alternative.



Alternative 1 & 2

Livestock grazing would not change.

Alternative 3 & 4

Livestock use would increase by 80 AUMs.

**Alternatives 5, 6,
& 7 - Preferred**

Livestock use would increase by 40 AUMs.

TIMBER

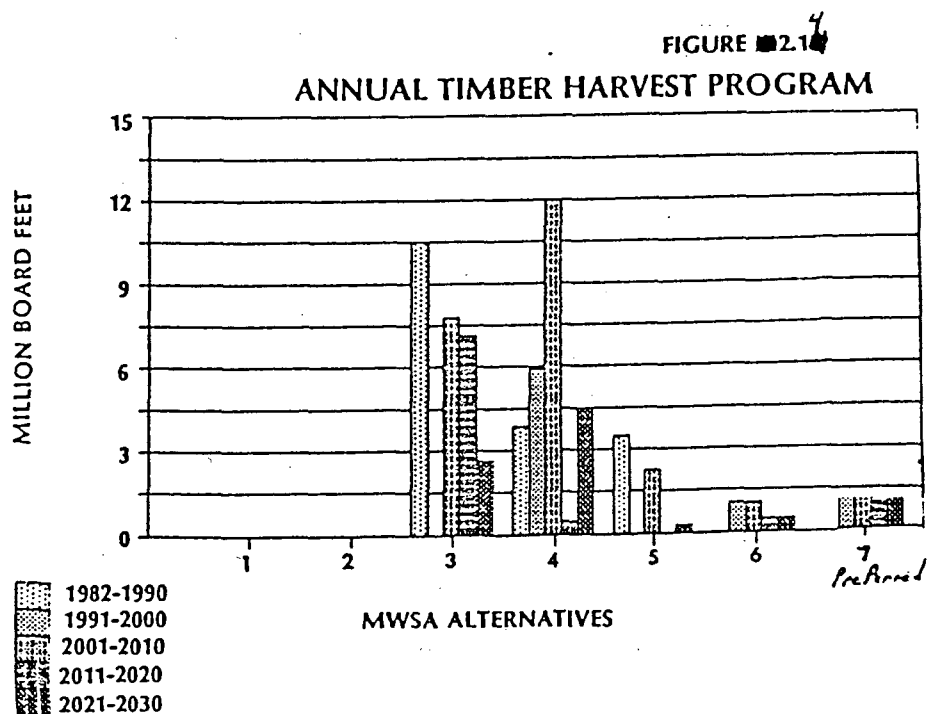
Approximately 53,500 acres, or 59 percent of the area, is classified as commercial forest land. The lower elevations and foothills of the study area are blanketed with Douglas fir; at higher elevations, lodgepole pine is predominant. Present use for firewood cutting in the Middle Fork Judith is low, due to limited and difficult access.

Issues

- What is the timber potential of the area, and where is timber management appropriate?
- What are the present uses, locations, and opportunities for cutting household firewood?

Comparison

Figure 2.14 displays the harvest volumes for five decades by alternative.



- Alternative 1** Under this alternative, no timber would be harvested. Firewood removal would remain the same.
- Alternative 2** The Wilderness Act prohibits timber harvest. Trees would not be cut for nonwilderness purposes, with the exception of prospecting, mining, and insect and disease control.
- Alternative 3** Under this alternative, about 283 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 2.7 million board feet would be harvested annually. Additional opportunities would be available for firewood removal.
- Alternative 4** Under this alternative, about 270 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 4.5 million board feet would be harvested annually. Additional opportunities would be available for firewood removal.
- Alternative 5** Under this alternative, about 61 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 0.3 million board feet would be harvested annually. Additional opportunities would be available for firewood removal.
- Alternative 6** Under this alternative, about 32 million board feet of timber would be harvested over the 50-year planning period. No timber would be harvested the first decade. By 2030, approximately 0.5 million board feet would be harvested annually. Some additional opportunity would be available for firewood removal.
- Alternative 7 Preferred** Under this alternative, about 28 million board feet of timber would be harvested over the 50-year planning period. No timber would be harvested the first decade. By 2030, approximately 0.7 million board feet would be harvested annually. Timber haul roads would be closed to the public, except to remove firewood.

SOIL AND WATER

Watershed condition in the study area is generally good. The Middle Fork Judith has a very stable watershed and is relatively insensitive to roading and logging.

Issues

- What are the present conditions and uses of the area's watershed, and what is its relative sensitivity to development activities?

Alternative 1

The watershed would remain undeveloped. Water quality would remain high. A full range of restoration practices could be used after a natural disaster.

Alternative 2

The watershed would remain essentially undeveloped. Water quality would remain high. The exclusion of motorized vehicles would, over time, return the watershed to a pristine condition. Wilderness classification would limit the kinds and extent of watershed restoration practices that would be used after a natural disaster, such as a flood or forest fire.

Alternative 3

The watershed would remain undeveloped. Water quality would remain high. A full range of restoration practices could be used after a natural disaster.

**Alternatives 4, 5, 6,
& 7 - Preferred**

All or part of the watershed would be developed. The stable watershed and relative insensitivity to roading and logging make the Judith suitable for development. The quality of water produced would provide continued use for irrigation, livestock, and household use. A full range of restoration practices could be used after a natural disaster.

MINERALS

Three areas of potential mineralization exist within the study area. Sapphire mining on lower Yogo Creek is active and has been active for many years. The area produces top quality sapphires. There is a potential for additional discoveries in Kelly Coulee. A second area is present in the Yogo Peak - Lake Elva area. Igneous rocks are present and may have caused a broad zone of mineralization (of silver, lead, zinc and copper) at depth. (Hamilton, M.M., Mayerle R.T. 1982) A third area exists in the Grendah Mountain area where silver, lead and zinc are associated with faults and fracture zones.

Issues

- What is hardrock mineral, and oil and gas potential of the area, and how should they be managed for that potential?

Alternative 1

Mineral development would be governed by mining and mineral leasing laws. No additional roads would be built for management of surface resources under this alternative. The area would be opened to all forms of mineral entry.

Alternative 2

Until December 31, 1983, the United States mining laws and all laws pertaining to mineral leasing apply to National Forest wilderness to the same extent as they applied to the area prior to its classification. Effective January 1, 1984, subject to existing rights, the minerals in land designated as wilderness are withdrawn from all forms of appropriation under the mining laws and laws pertaining to mineral leasing.

**Alternatives 3, 4, 5, 6,
& 7 - Preferred**

Mineral development would be governed by mining and mineral leasing laws. Rooding would increase the opportunities to explore and develop mineral resources. The most roads would be constructed under Alternative 3, the least under Alternative 7.

LANDS

The Middle Fork contains 1,154 acres of contiguous private in-holdings in multiple ownership. Smaller peripheral mineral claims on the west and north contain another 194 acres.

Issues

- What is the present landownership pattern, current access, and use? What is the opportunity for acquisition or to manage private in-holdings?
- What other energy needs, such as powerlines corridors, should be considered?

**Alternatives 1, 3, 4, 5,
6, & 7 - Preferred**

There would be no need to acquire any private in-holdings.

Alternative 2

Acquiring private in-holdings in the Middle Fork of the Judith is desirable to protect and perpetuate the natural integrity of the area. Scenic easements may also be used to protect these values. Other private lands could be excluded by slight boundary modifications.

All Alternatives

No need is apparent for other facilities, such as power transmission lines, areas to the west and east are more suitable for this use.

FACILITIES -- ROADS
AND TRAILS

Access is possible via ridge roads to mineral claims and by primitive roads over Studhorse Hill (of the area) and in and out of stream channels to private in-holdings. The study area contains 52 miles of primitive roads, 12 miles of low standard roads, and 75 miles of trails.

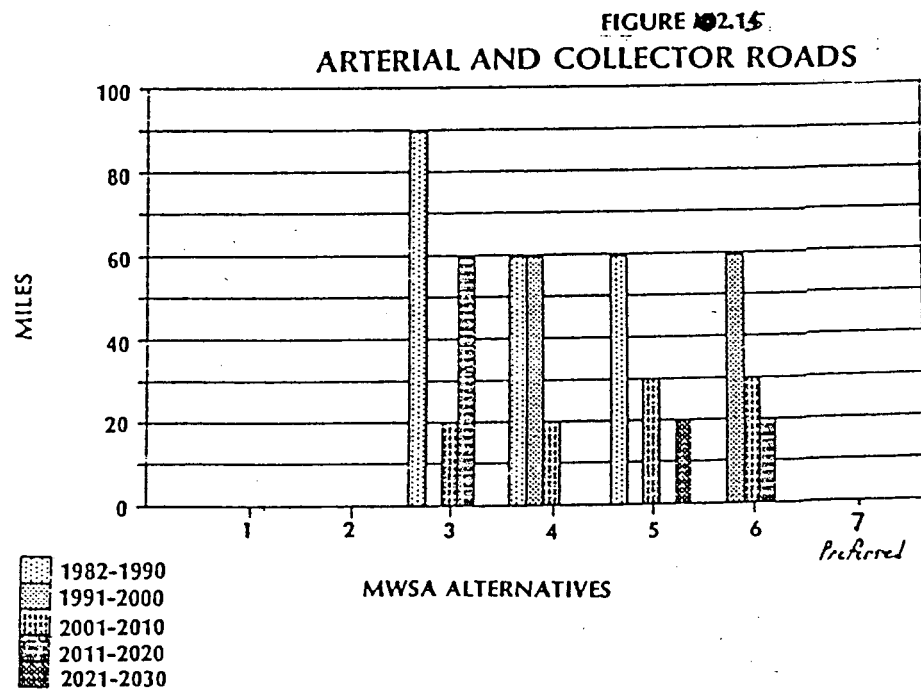
One transmission corridor passes through the southwestern corner of the study area. No known plans exist for other corridors.

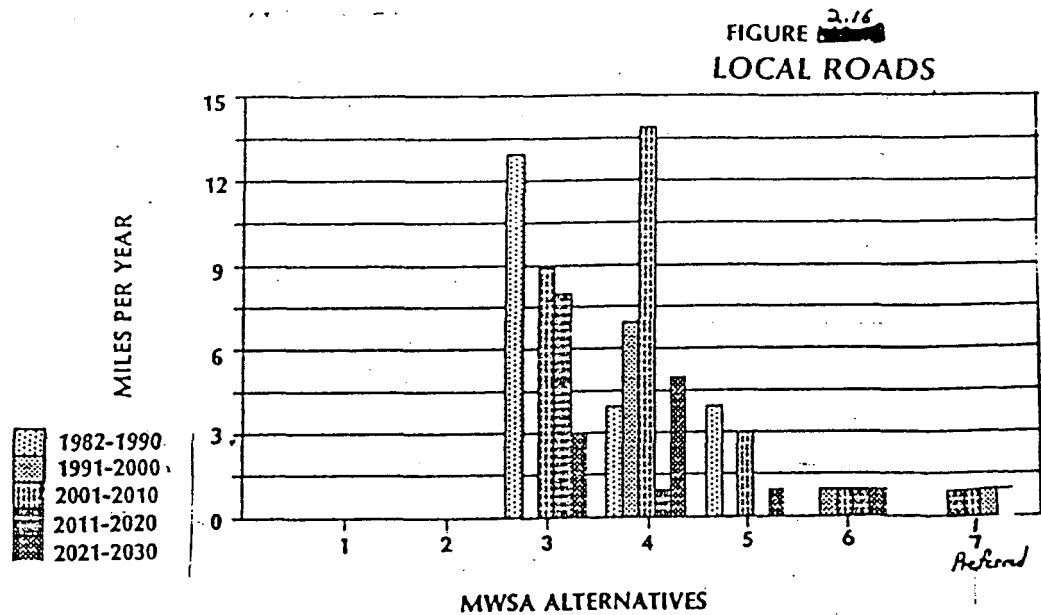
Issues

- What type, condition, and amount of road and trail access does the area contain?

Comparison

Figures 2.15 and 2.16 show the miles of arterial, collector and local roads for five decades, by alternative.





Alternative 1

The existing 64 miles of roads would not be maintained. The 75 miles of trails would be retained.

Alternative 2

The 64 miles of existing roads would be closed and rehabilitated. All 75 miles of trail would be retained for wilderness use and management.

Alternative 3

During the first five decades, 17 miles of arterial and collector roads and 330 miles of local roads would be constructed. These roads would require 5.6 miles of rights-of-way. Approximately 40 miles of trail would be retained.

Alternative 4

During the first five decades, 14 miles of arterial and collector roads and 310 miles of local roads would be constructed. These would require 5.6 miles of rights-of-way across private land. Approximately 40 miles of trail would be retained.

Alternative 5

During the first five decades, 11 miles of arterial and collector roads and 80 miles of local roads would be constructed. These roads would require 5.6 miles of rights-of-way. Approximately 54 miles of trail would be retained.

Alternative 6

During the first five decades, 11 miles of arterial and collector roads and 40 miles of local roads would be constructed. Approximately 62 miles of trail would be retained. Trail or road rights-of-way across 5.6 miles of private land would be required.

Alternative 7 - Preferred

During the first five decades, 30 miles of local roads would be constructed. No arterial or collector road would be needed. Approximately 72 miles of trail would be retained. Trail or road rights-of-way across 5.6 miles of private land would be required.

PROTECTION - FIRE

All fires are suppressed as quickly as possible. Because most of the study area is composed of old growth stands, the accumulation of natural fuel is high. Access is limited and potential for a major burn is great during extreme fire conditions.

Issues

- What is the present condition and the potential for serious fire? What are the current protection measures and what measures are needed?

Alternative 1

A Fire Management Plan, which uses both planned and unplanned fires to obtain recreation and wildlife objectives, would be developed.

Alternative 2

A Fire Management Plan, which may allow fires started by natural causes to burn within prescription, would be developed. Fire resulting from person-caused activities would be prevented and/or controlled at all times.

Alternative 3 & 4

All unplanned fires would be suppressed. Prescribed fire would be used to reduce timber harvest slash and improve wildlife and range habitat.

**Alternatives 5, 6,
& 7 - Preferred**

Prescribed fire would be used to reduce timber harvest slash and improve wildlife and range habitat. A Fire Management Plan, which uses prescribed fires from planned and unplanned ignitions will be developed to obtain recreation, range, and wildlife objectives.

**PROTECTION - INSECT
AND DISEASE**

Mountain pine beetle and western spruce budworm pose the greatest threat in the study area. Old growth lodgepole pine stands are the most susceptible to mountain pine beetle. This beetle reached epidemic levels in 1964 and has persisted since then. Although Douglas fir beetle and spruce budworm have not been a problem in recent years, the potential does exist for an outbreak in both Douglas fir and Englemann spruce. Spruce budworm is currently not a problem. However, this area was heavily infested in the early 1950s and 1960s. Destructive populations could rebuild. Should an insect epidemic occur, mortality could compound fire conditions.

Issues

- What is the present condition and the potential for serious insect and disease infestation? What are the current protection measures, and what measures are needed?

Alternative 1

Insect and plant disease outbreaks would not be artificially controlled, unless necessary to protect timber or other valuable vegetation outside the area.

Alternative 2

In classified wilderness, insect and plant disease outbreaks are not artificially controlled, unless necessary to protect timber or other valuable vegetation outside the wilderness area.

**Alternatives 3, 4, 5, 6,
& 7 - Preferred**

Vegetation management would be directed to reduce losses from insect and plant disease on developed lands. On lands that remain in a semi-primitive recreation setting, insect and plant disease outbreaks would not be artificially controlled, unless necessary to protect timber or valuable vegetation outside the area.

**QUANTITATIVE
ECONOMIC COMPARISON**

Issues

- What resources does the area contain and how should the study area's resource outputs be allocated toward meeting the RPA program goals?

- What considerations should be given to maintaining current employment levels for dependent communities?

National needs for goods and services are reflected in the objectives assigned to the Lewis and Clark National Forest by the RPA (Resource Planning Act) Program. (See Table 2.2 in the Forest Plan EIS). Table 2.2 (page 2-23) displays some of the contributions the Middle Fork Judith makes to the RPA Program.

The Middle Fork Judith Wilderness Study Area is in Judith Basin County. Judith Basin County is dependent on farming and ranching. It has a stable population, which is projected to have a slight decline over the next 20 years. The study area is near wood processing plants -- especially White Sulphur Springs, which is about 30 miles to the southeast.

Benefits

Benefit values were assigned to market outputs and selected nonmarket outputs. Dollar values were assigned to benefits from timber, range, recreation, and oil and gas leasing. Only lease rental rates were used for computing mineral values. There are no estimates available for hardrock mineral values or oil and gas royalty values. These values are discussed under costs and benefits in the Alternative Formulation at the beginning of this chapter.

Return to U.S. Government

This is the revenue the Forest collects and returns to the U.S. Treasury from timber sales, grazing fees, timber purchaser's road credits, sale area improvement collections, recreation fees, mineral leasing, and land use charges.

Return to State

By Federal law, 25 percent of this revenue is returned to the state for use by the counties for schools and roads. Counties' shares of the payment are determined by the acreage of National Forest within the county. In addition, counties receive PILT (payment in-lieu of taxes). PILT ranges from 10 cents to 75 cents per acre.

Costs

Forest Service costs are estimated for each alternative.

Table 2.3 displays the benefits and costs of the alternatives.

TABLE 2.3
MIDDLE FORK JUDITH
ANNUAL BENEFITS AND COSTS
(Thousand Dollars)
(Values Given In 1978 Dollars)

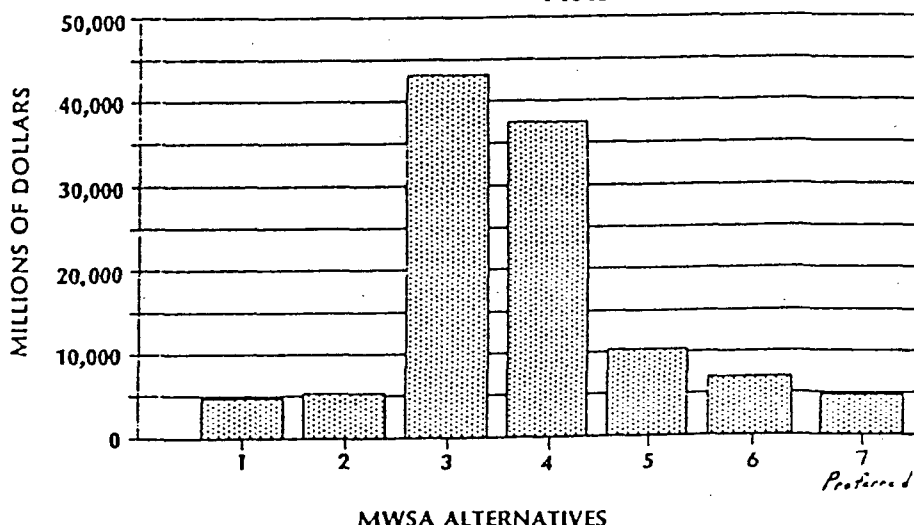
DECADE	ALT	ALT	ALT	ALT	ALT	ALT	(Preferred) ALT
	1	2	3	4	5	6	7
<u>1982-1990</u>							
Total Benefits	269.0	282.6	3470.6	1447.3	1319.0	269.1	269.1
Returns To US Govt.	6.6	1.6	218.6	84.6	76.6	6.6	6.6
Total Costs	72.3	62.4	286.4	166.0	141.6	72.4	72.4
Total Net Benefits	196.7	220.2	3184.2	1281.3	1177.4	196.7	196.7
<u>1991-2000</u>							
Total Benefits	289.9	305.6	248.6	2083.9	272.8	606.0	499.9
Returns To US Govt.	6.6	1.6	6.6	126.6	6.6	28.6	20.6
Total Costs	72.3	62.4	71.9	213.2	72.3	114.4	86.4
Total Net Benefits	217.6	243.2	176.7	1870.7	200.5	491.6	413.5
<u>2001-2010</u>							
Total Benefits	311.1	326.7	2614.2	3916.6	982.6	622.7	521.1
Returns to US Govt.	6.6	1.6	162.7	248.7	52.7	28.7	20.6
Total Costs	72.3	62.4	235.9	317.5	123.2	108.0	86.4
Total Net Benefits	238.7	264.3	2378.3	3599.1	859.4	514.7	434.7
<u>2011-2020</u>							
Total Benefits	332.0	348.8	2434.4	408.9	311.2	461.2	542.0
Returns to US Govt.	6.6	1.6	150.7	16.7	6.7	16.7	20.6
Total Costs	72.3	62.4	236.9	81.9	72.4	97.7	86.4
Total Net Benefits	259.7	286.4	2197.5	327.0	238.8	363.5	455.6
<u>2021-2030</u>							
Total Benefits	352.9	371.8	1094.4	1636.8	415.1	475.0	562.9
Returns to US Govt.	6.6	1.6	60.8	96.8	12.7	16.7	20.6
Total Costs	72.3	62.4	124.1	158.4	78.4	82.4	86.4
Total Net Benefits	280.6	309.0	970.3	1478.4	336.7	392.6	476.5
PNV @ 4%	4858.8	5406.4	43302.8	37778.9	15195.6	7525.7	7513.7

PRESENT NET VALUE

PNV (present net value) is an economic evaluation tool used to examine the economic differences between alternatives. PNV is the discounted benefits less discounted costs associated with providing all resource outputs to which monetary value can be assigned, including both market and selected nonmarket outputs. PNV was calculated over a 50-year planning horizon because cost and benefit data for the MWSA areas were not available beyond the first 50 years. The costs and benefits used in this calculation are mentioned in the Alternative Formulation portion of this chapter. Figure 2.17 displays PNV for each alternative. There are no values available for hardrock mineral or oil and gas production rates, because so little is known by the agency on future production potential.

The allocation and scheduling of acres to management prescriptions for each alternative was done by maximizing PNV in FORPLAN. This satisfied NFMA regulations which require that each alternative represent the "most efficient combination of management practices examined that can meet the objectives established in the alternatives."

FIGURE 2.17
PRESENT NET VALUE



PRESENT NET VALUE

Alternative 1

Alternative 1 has a low PNV due to no revenues received from timber harvesting and also recreation being valued as dispersed recreation at \$3.00/RVD. The only commodity which generates revenue is range. Big game hunting days, at a value of \$21.00/RVD, contribute significantly to the benefits.

Alternative 2

Alternative 2 ranks higher than Alternative 1 because of wilderness classification. This classification assigns a high value to primitive (wilderness) recreation (\$8.00/RVD). Therefore, benefits from recreation are much greater than those from Alternative 1. All other outputs are the same as Alternative 1.

**Alternatives 3, 4, 5, 6,
& 7 - Preferred**

Under these alternatives, PNV is higher because of timber harvesting. The decrease in big game hunting benefits are offset by high timber revenues. These alternatives have a higher PNV than Alternatives 1 and 2, with Alternative 3 having the highest PNV.

EMPLOYMENT AND INCOME

Tables 2.4 and 2.5 display employment and income changes. These changes are based on increases in timber harvest and grazing levels. Projections were made based on an input/output model used for Forest Plan alternatives. The input/output model is described in the planning record, "Input/Output Model". The magnitude and effects of these changes are discussed in Chapter IV. No projections are made for employment and income from mineral development because of the uncertainties involved.

TABLE 2.4
EMPLOYMENT CHANGES FROM CURRENT PLAN
(PEOPLE)

TIME	1	2	3	4	5	6	(Preferred) 7
1982-1990	0	0	140	50	45	0	0
1991-2000	0	0	0	80	0	15	10
2001-2010	0	0	100	160	30	15	10
2011-2020	0	0	95	5	0	5	10
2021-2030	0	0	35	60	5	5	10

TABLE 2.5
INCOME CHANGES FROM CURRENT PLAN
(THOUSANDS OF DOLLARS)

TIME	1	2	3	4	5	6	(Preferred) 7
1982-1990	0	0	1990	730	660	0	0
1991-2000	0	0	0	1130	0	210	140
2001-2010	0	0	1460	2270	430	210	140
2011-2020	0	0	1350	90	0	90	140
2021-2030	0	0	510	840	60	90	140

**COMPARISON OF
QUALITATIVE NET
PUBLIC BENEFITS**

Introduction

The interdisciplinary team evaluated the alternatives to determine which alternative maximized net public benefit. Net public benefit is important since it represents the overall value to the nation of all benefits less all costs, regardless of whether the costs and benefits are expressed in priced (PNV) or non-priced terms (often subjectively measured). The PNV component of each alternative's net public benefit is displayed in Table 2.3.

Each alternative is compared as to how well it addresses the non-priced components of net public benefit. The non-priced components of net public benefit include:

1) Elk Hunting Quality -- The quality of big elk hunting varies by alternative. Currently elk hunting quality indicators include the length of the hunting season and the population structure of the animals harvested. Both quality indicators are influenced by the currently unroaded situation on the study area. Timber harvesting on elk hiding cover areas would have varying impacts on elk hunting quality. Each alternative was examined to determine its impact on elk hunting quality and whether or not the PNV trade-offs are acceptable.

2) Semi-Primitive Recreation Setting -- According to public involvement comments, the maintenance of a semi-primitive recreation setting in certain parts of the Forest is important. The Middle Fork Judith is highly valued for its semi-primitive recreation opportunity.

3) Visual Quality -- Visual quality constraints have been included in the FORPLAN runs and therefore reduce the PNV. Whether the benefits produced exceed the costs is a subjective component that needs to be considered in the non-priced net public benefit analysis.

4) Post, poles and firewood -- The opportunities for local people, ranchers, and small business to cut posts, pole, and/or firewood are not valued in the PNV. This opportunity varies by alternative.

Alternative 1

Alternative 1 would increase the quality of elk hunting the most of any alternative. Timber is not harvested on a regulated basis. Grazing would not increase. These factors contribute to an increase in the overall elk population potential. The population structure should be maintained or improved. The small amount of area that may be disturbed by mineral development would not effect elk populations.

The Middle Fork Judith would maintain its semi-primitive recreation setting. Both motorized and nonmotorized recreation would be permitted.

Visual quality would not be affected.

The opportunity to cut posts, poles, and/or firewood would not increase.

Alternative 2

Alternative 2 would maintain the quality of elk hunting. No timber would be harvested. Grazing would not increase.

The Middle Fork Judith would be managed as wilderness (primitive recreation setting). Motorized recreation would not be permitted. There would be no opportunity for mineral entry after January 1, 1984.

Visual quality would not be affected.

The opportunity to cut posts, poles, and/or firewood would be foregone.

Alternatives 3 & 4

Alternatives 3 and 4 would drastically lower the quality of elk hunting. Because most of the lands are accessed for timber, hiding cover would be reduced. With less hiding cover, animals would be harvested quickly and fewer mature animals would be available. The opportunity for mineral exploration would increase with increased access. The effects of development would not have any major effects on other surface resources.

Alternative 3 would not retain any of the area in a semi-primitive recreation setting. Alternative 4 would retain 8,000 acres in a semi-primitive recreation setting.

Alternatives 3 and 4 affect visual quality the most. They contain the most acres in the modification class.

The opportunity to cut posts, poles, and/or firewood would increase.

Alternatives 5 & 6

Alternatives 5 and 6 would lower the quality of elk hunting slightly. The upper Middle Fork would be accessed. The lower area would remain undeveloped. Timber harvest would cause easier and quicker access to elk.

Alternative 5 would retain 60 percent of the area in a semi-primitive recreation setting. Alternative 6 would retain 75 percent of the area in a semi-primitive recreation setting.

Alternative 5 would affect the visual quality on 38,000 acres. Alternative 6 would affect 24,000 acres.

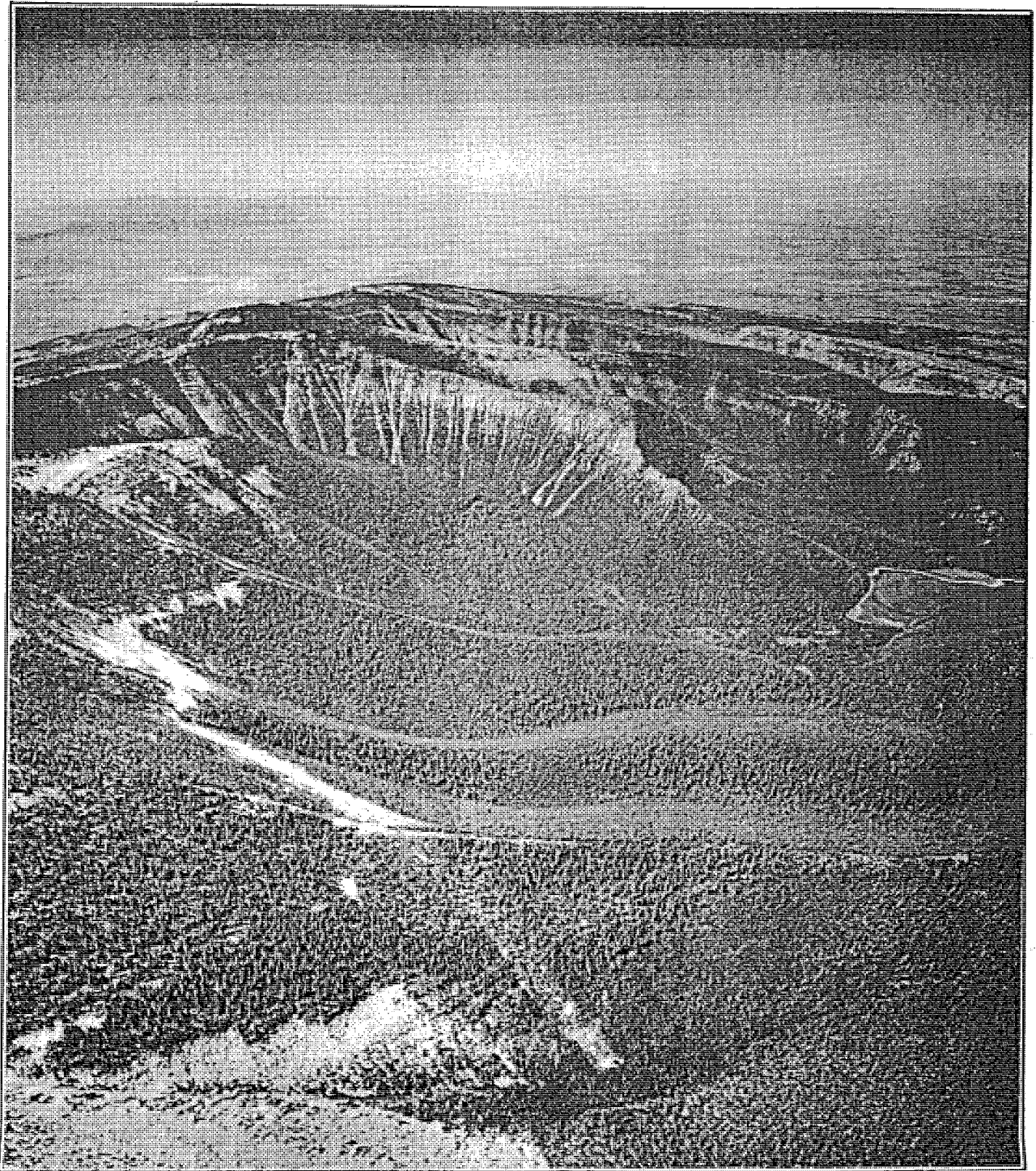
The opportunity to cut posts, poles, and/or firewood would increase slightly. The upper Middle Fork would be more opened to mineral exploration. The effects of mineral development would not effect other surface resources.

**Alternative 7
Preferred**

Alternative 7 (Preferred) would slightly lower the quality of elk hunting. The Harrison Creek and Weatherwax drainages in the upper Middle Fork would be accessed for timber harvest. Except for firewood cutting, the roads would be closed to the public.

Alternative 7 would retain 87 percent of the area in a semi-primitive recreation setting. The visual quality would be affected on 11,600 acres.

The opportunity to cut posts, poles, and/or firewood would increase slightly. The Harrison Creek and Weatherwax drainages would be more opened to mineral exploration. The effects of mineral development would not effect other surface resources.



MONTANA WILDERNESS STUDY AREA IN THE BIG SNOWY MOUNTAINS.

**ALTERNATIVES
CONSIDERED IN DETAIL**

The following alternatives for the Big Snowies Wilderness Study Area were considered in detail.

**Alternative 1
Preferred**

The Big Snowies Wilderness Study Area would be managed for semi-primitive recreation and wildlife habitat. (See Figure 2.18).

Alternative 2

The Big Snowies Wilderness Study Area would be recommended for wilderness classification. (See Figure 2.19).

Alternative 3

The Big Snowies Wilderness Study Area would be managed to provide a high level of commodity products. (See Figure 2.20).

Alternative 4

The Big Snowies Wilderness Study Area would be managed to provide a moderate level of commodity products. (See Figure 2.21).

Alternative 5

The Big Snowies Wilderness Study Area would be managed to provide a low level of commodity products. (See Figure 2.22).

The allocation of land management emphasis by alternative is shown in Table 2.6. A summary of resource outputs for the alternatives is shown in Table 2.7.

Figure 2.18

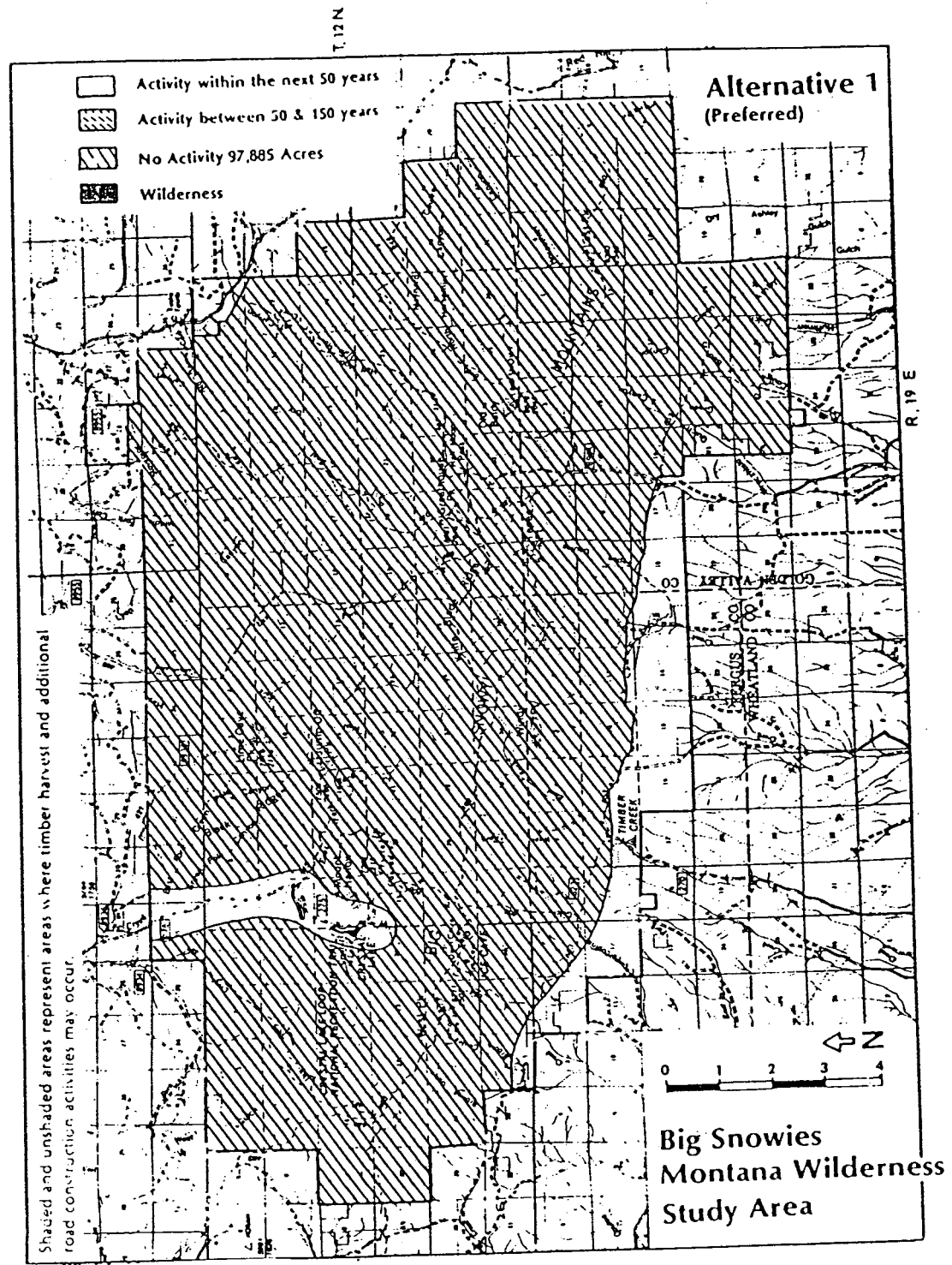


Figure 2.19

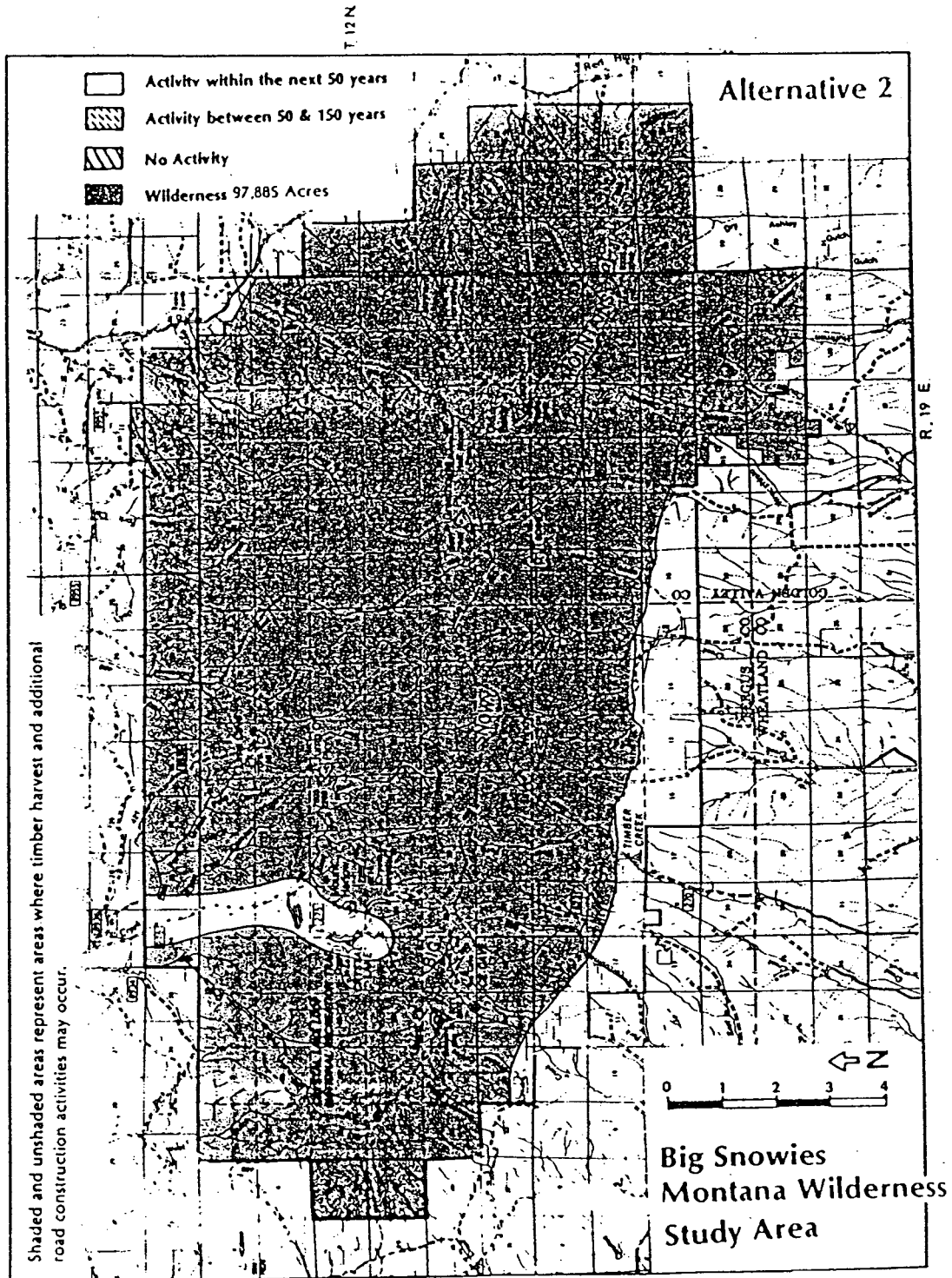


Figure 2.20

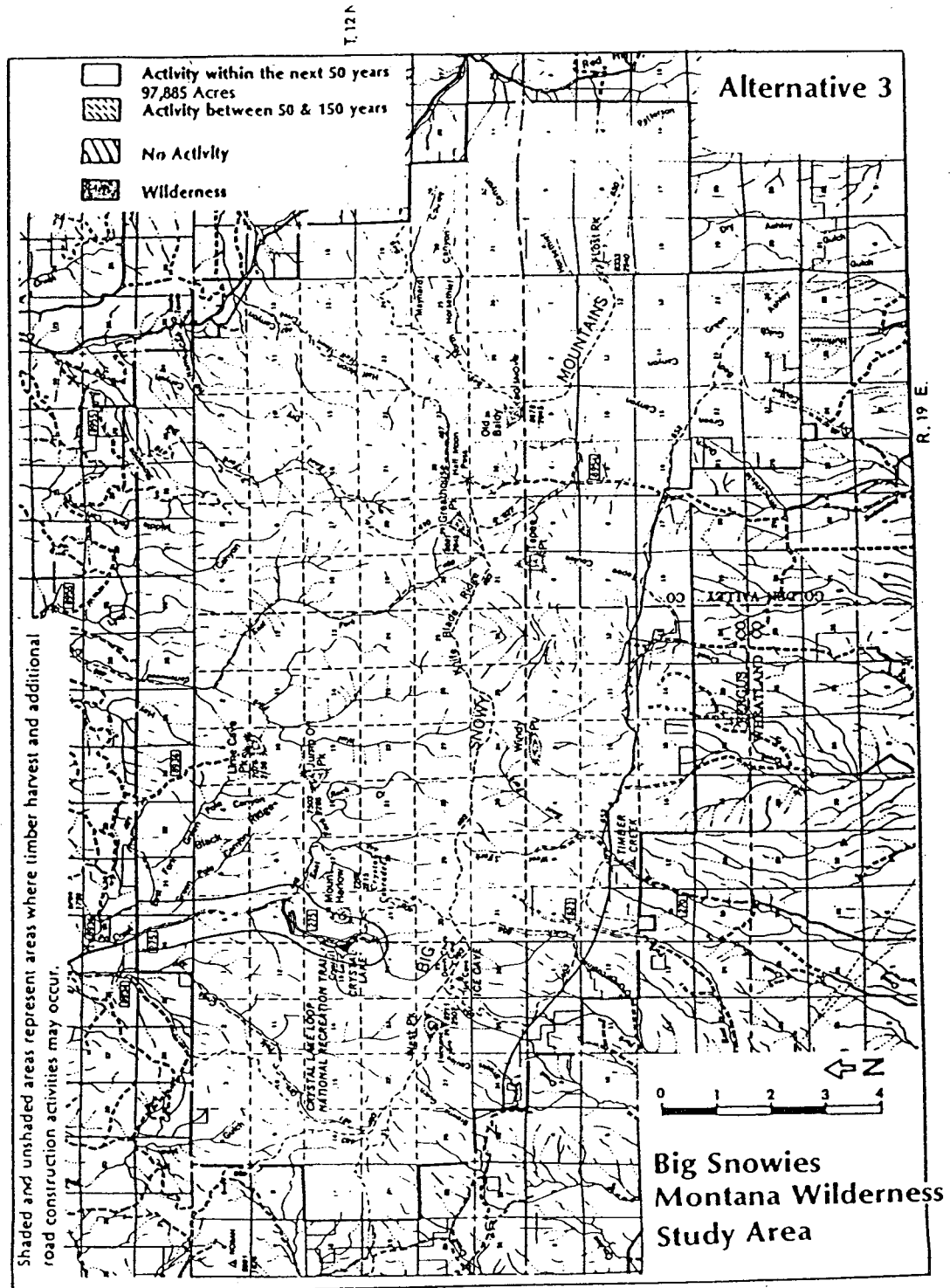


Figure 2.21

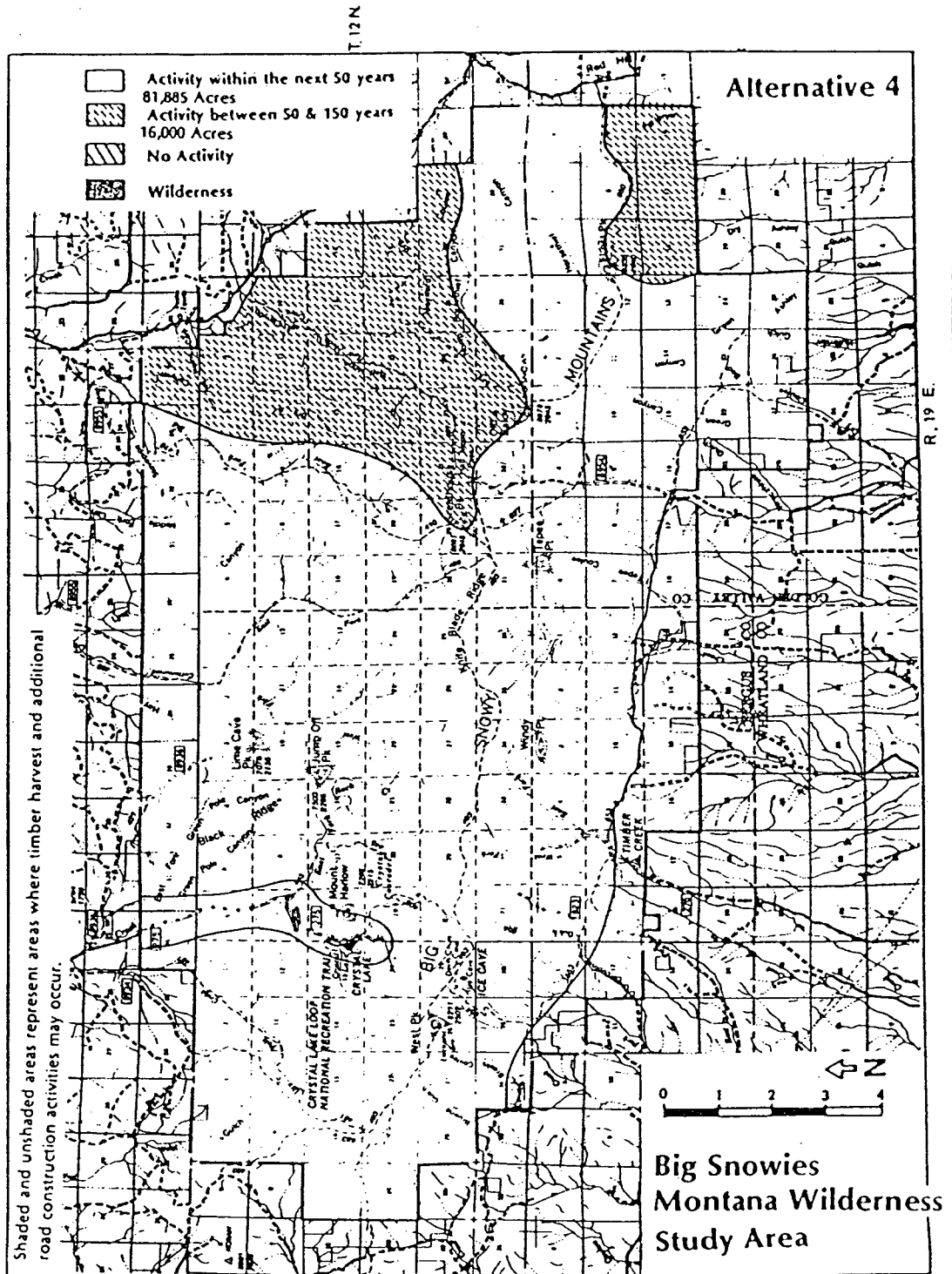


Figure 2.22

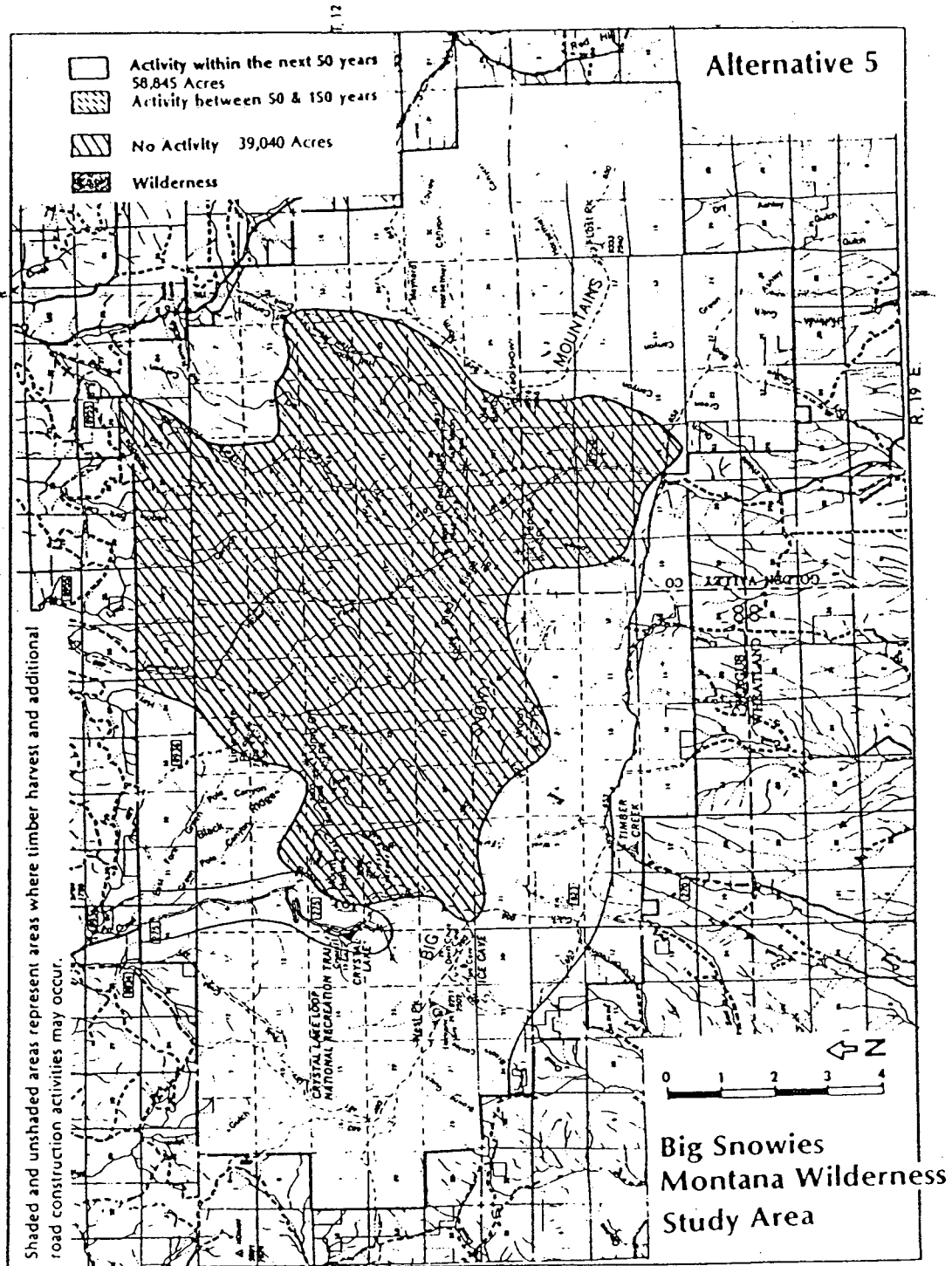


TABLE 2.6 Allocation of Acres to Management Emphasis by Alternative - Big Snowies

	<u>Alt. 1</u>	<u>Alt. 2</u>	<u>Alt. 3</u>	<u>Alt. 4</u>	<u>Alt. 5</u>
Minimum Level Management	85289	0	27369	30715	47540
Range Management	9603	0	13220	16131	22182
Timber Management	0	0	28119	44375	23161
Timber/Range Management	0	0	3947	3115	777
Timber/Wildlife/ Visual Management	0	0	14880	648	1499
Wildlife Management	2812	0	5223	2901	2726
Wildlife/Range Management	181	0	5126	0	0
Wilderness Management	0	97885	0	0	0

TABLE 2.7 Summary of Total Resource Production by Alternative - Big Snowies (Average Annual Output)

RESOURCE USE AND DEVELOPMENT FACTORS		UNITS	ALT-1 (Preferred)	ALT-2	ALT-3	ALT-4	ALT-5
<u>Recreation Use Potential by 2030</u>		Thousand RVOs					
(Base Year 1980 in Parentheses)							
- Primitive (0)			0	11.5	0	0	0
- Semi-Primitive (20.6)			20.6	0	0	3.4	8.2
- Roaded Natural (0)			0	0	163.1	136.3	97.9
<u>Recreation Setting by 2030</u>		Thousand Acres					
(Base Year 1980 in Parentheses)							
- Wilderness (0)			0	97.9	0	0	0
- Semi-Primitive (97.9)			97.9	0	0	16.0	39.1
- Roaded Natural (0)			0	0	97.9	81.9	58.8
<u>Visual Quality Objectives</u>		Thousand Acres					
- Preservation			0	97.9	0	0	0
- Partial Retention			97.9	0	0	16.0	39.1
- Modification			0	0	97.9	81.9	58.8
<u>Wildlife</u>							
- Habitat Improvement	Acre Equivalents						
- 1982-1990			110	0	290	100	100
- 2021-2030			110	0	320	100	100
- Elk Population Potential	Number						
- 1982-1990			100	100	100	100	100
- 2021-2030			100	100	100	100	100
- Elk Hunter Recreation	Hunter Days						
- 1982-1990			1000	1000	1000	1000	1000
- 2021-2030			1000	1000	800	900	900
<u>Range</u>		AUMs					
- 1982-1990			3000	2700	3000	3000	3000
- 2021-2030			3300	2700	3600	3600	3300
<u>Timber</u>							
- Land Available, Capable, and Suitable	Thousand Acres		0	0	46.1	49.9	44.8

RESOURCE USE AND
DEVELOPMENT FACTORS

	UNITS	ALT-1 (Preferred)	ALT-2	ALT-3	ALT-4	ALT-5
<u>Timber (Continued)</u>						
- Programmed Sales Offered	Million Board Feet					
- 1982-1990		0	0	.4	.4	.4
- 1991-2000		0	0	0	0	1.6
- 2001-2010		0	0	.2	.2	.2
- 2011-2020		0	0	3.9	2.1	1.1
- 2021-2030		0	0	5.3	1.9	3.4
- Reforestation (Natural and Planting)	Acres					
- 1982-1990		0	0	40	40	50
- 1991-2000		0	0	0	0	210
- 2001-2010		0	0	20	20	30
- 2011-2020		0	0	480	260	140
- 2021-2030		0	0	660	240	430
<u>Roads</u>						
- Arterial and Collector to be constructed	Miles					
- 1982-1990		0	0	.8	.8	.8
- 1991-2000		0	0	0	0	1.5
- 2001-2010		0	0	.5	.5	.5
- 2011-2020		0	0	3.1	3.9	1.0
- 2021-2030		0	0	4.6	3.9	3.1
- Local	Miles					
- 1982-1990		0	0	1	1	1
- 1991-2000		0	0	0	0	2
- 2001-2010		0	0	1	1	1
- 2011-2020		0	0	5	3	2
- 2021-2030		0	0	7	3	4
<u>Prescribed burning</u>	Acres	90	0	220	130	100
<u>Social/Economic</u>						
-Change in Employment						
-1982-1990	Person Years	0	0	5	5	5
-2021-2030		0	0	70	25	45

<u>Returns to U.S. Government</u> ^{1/}	Thousand Dollars					
- 1982-1990		52.4	4.9	60.4	60.4	60.4
- 2021-2030		52.4	4.9	159.5	71.5	120.7
<u>Total Budget required to implement</u> ^{1/}	Thousand Dollars					
- 1982-1990		111.0	83.6	165.4	165.6	165.6
- 2021-2030		123.3	82.0	315.8	240.0	277.7
<u>Present Net Value @ 4%</u>	Thousand Dollars	-677.4	427.7	558.1	151.2	341.0

^{1/} Values given in 1978 dollars

**ALTERNATIVE
COMPARISON**

**Alternative 1
Preferred**

Alternative 1 would maintain the Big Snowies Wilderness Study Area much like it is today. The area would remain undeveloped. Grazing would continue and increase slightly over the planning horizon. Timber would not be harvested on a regulated basis. However, posts, poles, and firewood would continue to be available. Both motorized and nonmotorized semi-primitive recreation opportunities would continue, as directed by the Forest Travel Plan.

Alternative 2

Alternative 2 would recommend wilderness classification for the Big Snowies Wilderness Study Area. Wilderness designation would result in the area being managed to leave it unimpaired for future generations use and enjoyment. Timber and motorized recreation opportunities would be foregone. Livestock grazing would continue and be maintained at the current level.

Alternative 3

Alternative 3 would provide the most timber and range outputs. All of the study area would be developed. Road construction, timber harvest, and livestock AUMs would be the greatest of any alternative. Semi-primitive recreation opportunities would be foregone. Wildlife habitat would change and elk hunting opportunity would decrease.

Alternative 4

Alternative 4 also would provide moderate levels of timber and range outputs. About 85 percent of the study area would be developed. Most semi-primitive recreation opportunities would be foregone. Elk hunting opportunity would decrease.

Alternative 5

Alternative 5 would provide low levels of timber and range outputs. About 60 percent of the study area would be developed. Many semi-primitive recreation opportunities would be foregone.

RECREATION

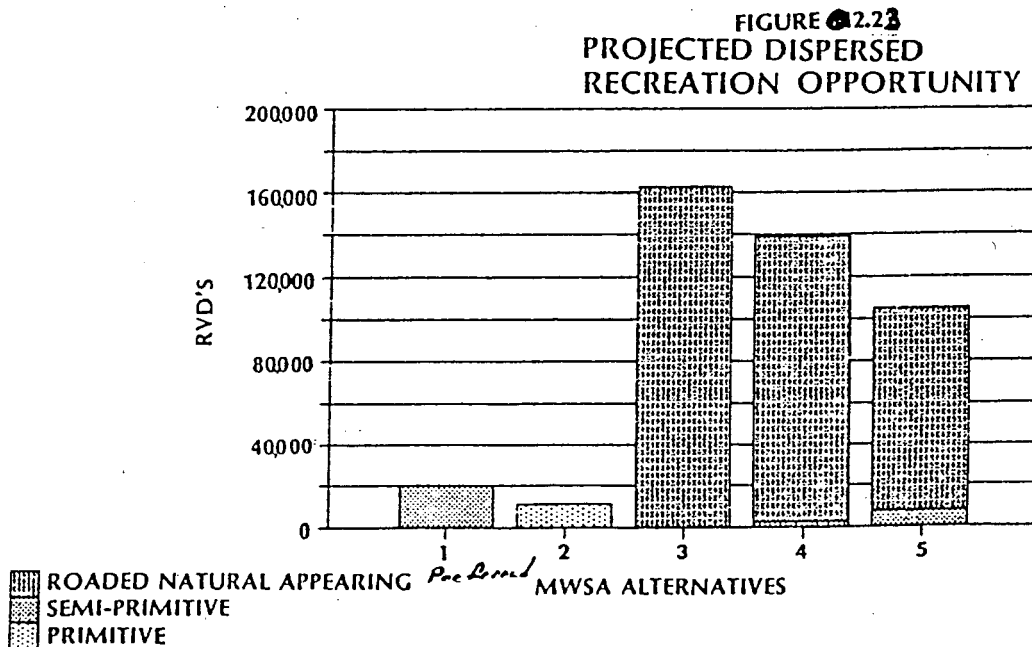
Current available dispersed recreation opportunity is 20,600 RVDs of semi-primitive recreation in the Big Snowies Wilderness Study Area. Current use is about 4,000 RVDs semi-primitive, nonmotorized recreation and 1,700 RVDs of semi-primitive motorized recreation. The study area contains no special facilities for elderly or handicapped people.

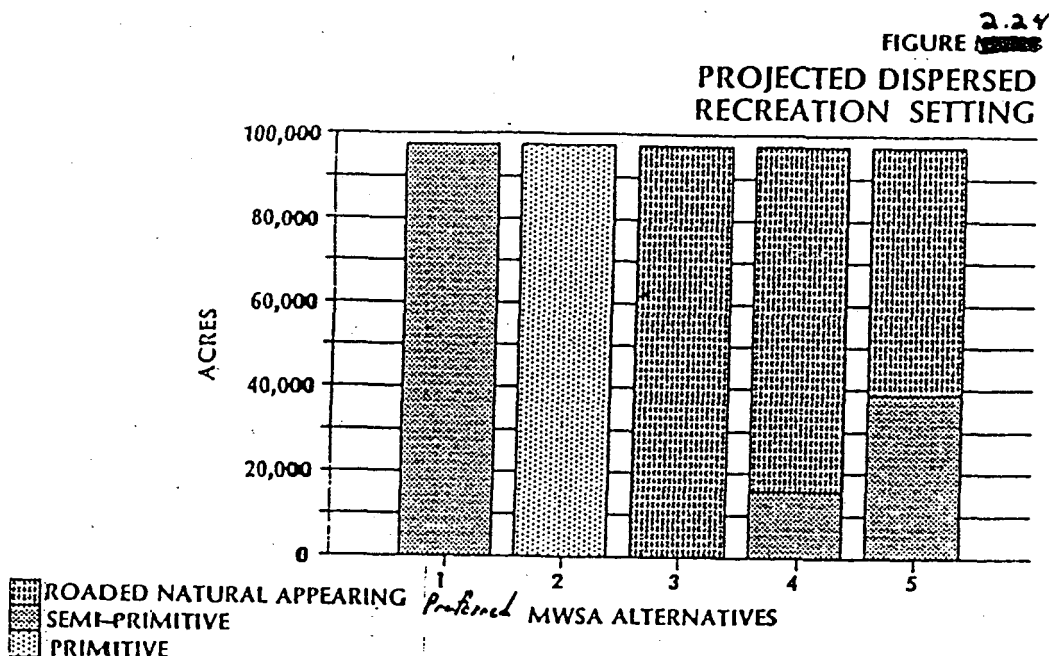
Issues

- What are the amounts and kinds of recreation opportunities the area presently supports or is capable of supporting?
- What is the current type and amount of motorized vehicle use and what is the potential for that use?
- How much need is there for the study area to contribute to recreation opportunities for physically handicapped and elderly persons?

Comparison

Figures 2.23 and 2.24 display the projected recreation opportunity and recreation setting in 2030, by alternative.





**Alternative 1
Preferred**

(Note: Rangers Check Content)

The Big Snowies Wilderness Study Area would provide about 20,600 RVDs of semi-primitive motorized and nonmotorized recreation. The trails on the east side of the Snowies and along the ridge would continue to be closed to all vehicles. This would maintain the solitude of the Crystal Lake recreation area. The trails on the west side of the mountains would continue to be opened to motorbikes.

Alternative 2

The area would provide 11,500 RVDs of primitive recreation (wilderness) opportunity. Under wilderness classification the area would be closed to motorized vehicles.

Alternative 3, 4, & 5

As areas would be roaded, the recreation setting would change to roaded natural and use levels would increase. Alternative 3 would provide 163,100 RVDs of roaded natural recreation opportunity. Alternative 4 would provide 136,300 RVDs of roaded natural recreation and 3,400 RVDs of semi-primitive recreation. Alternative 5 would provide 97,900 RVDs of roaded natural recreation and 8,200 RVDs of semi-primitive recreation.

VISUAL RESOURCES

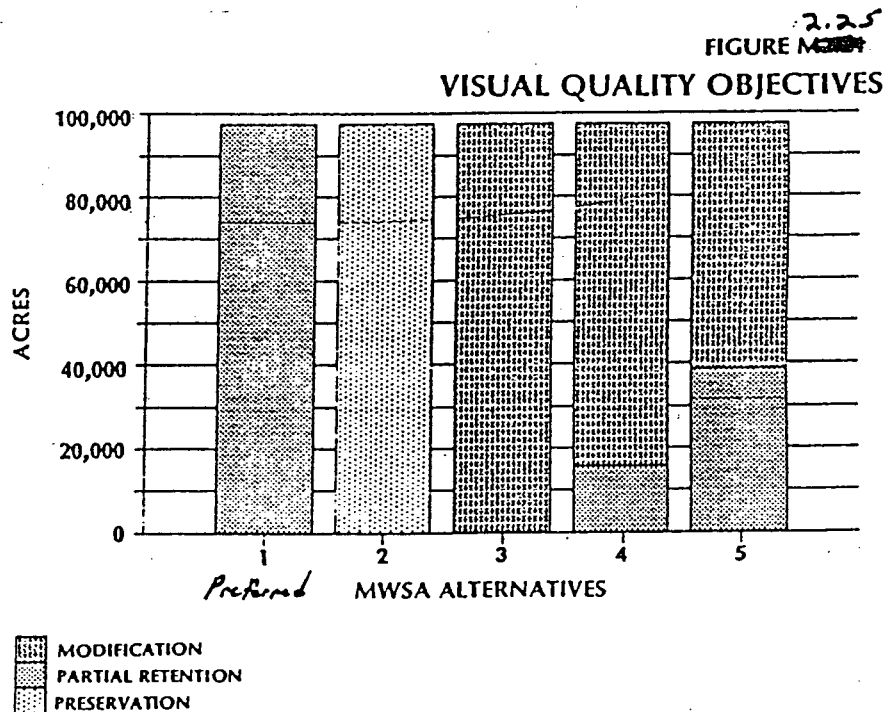
The Big Snowies Wilderness Study Area is essentially a natural environment. The rock formations and abrupt cliffs which rise from the drainage bottoms are unique features. The main ridge, running east-west, has alpine and tundra vegetation. From the ridge there are unobstructed views of the surrounding plains, agricultural lands, and distant mountain ranges. From Knife Blade ridge, on the east end of the area, one can look down to the southeast onto the Twin Coulee Unit of the BLM land. The BLM studied the Unit for wilderness classification and recommended it for resource development. Any resource development in the Twin Coulee Unit will be visible from parts of the Big Snowies Wilderness Study Area.

Issues

- What esthetic value does the area contain, and how should these values be protected?

Comparison

Figure 2.25 shows the acres in each of the visual management objectives: preservation, partial retention, and modification.



**Alternative 1
Preferred**

The study area would be managed to maintain the natural landscape of the area. The VQO for the area would be partial retention, which means man's activities may be evident but must remain subordinate to the characteristic landscape.

Alternative 2

If the area were managed for wilderness the VQO would be preservation, which means man's activities are not detectable.

Alternative 3

The area would be managed for high commodity production, resulting in a VQO of modification for the entire area. With this VQO man's activities may dominate the characteristic landscape, but at all times must, use natural form, line, color, and texture. Therefore, when the area is viewed from a distance the visual change would blend with the natural surroundings.

Alternative 4

The area would be managed for moderate commodity production, resulting in a retention VQO on 39,040 acres and a modification VQO on 58,845 acres.

Alternative 5

The area would be managed for low commodity production, resulting in a retention VQO on 16,000 acres and a modification VQO on 81,885 acres.

CULTURAL RESOURCES

Cultural resources are managed under the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the Archaeological and Historical Conservation Act of 1974, and the Archaeological Resource Protection Act of 1979.

**Alternatives 1 - Preferred
& 2**

These alternatives would have no development; therefore, the risk of damage to cultural resources would be slight.

Alternative 3

Generally, the risk of damage to cultural resources increases with development and access, so this alternative would have the greatest risk to the cultural resources. Project work would continue to require inventory of sites and implementation of appropriate mitigating measures.

Alternatives 4 & 5

These alternatives would have moderate development. Intensively managed areas would have the greatest risk. Project inventory and evaluation would continue.

WILDERNESS

National Forest System Wilderness is managed to preserve its natural condition under the Wilderness Act of 1964 and the CFR 36 Part 293 (Wilderness and Primitive Areas). Wilderness study areas are managed to protect their wilderness character until Congress decided on their classification.

Issues

- What are the wilderness attributes of the study area and to what extent are they needed for wilderness?
- What considerations should be given to a diversified National Wilderness Preservation System when proposing lands for wilderness?
- What other Federal lands are classified or proposed as wilderness or are under study as wilderness in the surrounding area, and to what extent should they influence the classification of the study areas?

WARS

Wilderness quality is reflected by the WARS (Wilderness Attribute Rating System). The 28-point rating system evaluates the area on natural integrity, apparent naturalness, solitude opportunity, and primitive recreation setting. Big Snowies received a rating of 24 under this system. This rating reflects some disruption of natural integrity. The range is surrounded by agricultural land. Several major roads are near the Snowies and these roads are visible from the crest. Also, there is a paved road that accesses Crystal Lake Recreation Area, which is in the center of the western half of the Snowies. The study area contains 50 miles of low standard roads. Although much of the study area is isolated, the sights and sounds of man are often nearby.

**Unique Ecosystem
& Wildlife Species**

In the RARE II analysis the Big Snowies was identified as one area that contains the Foothills Prairie Ecosystem. Within the northwest corner of the study area, there are 3,650 acres of this ecosystem. The study area was not selected to fill a target for wilderness-associated wildlife species representation.

**Relationship to Other
Wilderness Areas**

Within 250 miles of the Big Snowies Wilderness Study Area are 2.8 million acres of classified wilderness. There are also several areas which are being studied for possible wilderness classification by the Forest Service and Bureau of Land

	Management. The Big Snowies would provide weekend visitation opportunities from the population centers of Great Falls, Lewistown, and Billings.
Comparison	Table 2.7 displays the acres of recommended wilderness and the recreation opportunity, by alternative. Recreation opportunity is primitive within classified wilderness.
Alternative 1 Preferred	The Big Snowies would be managed for semi-primitive recreation opportunities. The opportunity for future wilderness classification would remain on all 97,885 acres.
Alternative 2	Wilderness classification would add 97,885 acres to the National Wilderness Preservation System.
Alternative 3	The opportunity for wilderness classification would be foregone on all 97,885 acres.
Alternative 4	The opportunity for wilderness classification would be foregone on 58,845 acres. The opportunity would be retained on 39,040 acres.
Alternative 5	The opportunity for wilderness classification would be foregone on 81,885 acres. The opportunity would be retained on 16,000 acres.

WILDLIFE AND FISH

Major big game species in the Big Snowies are mule deer, black bear, and mountain goat. Elk numbers have been increasing gradually in the northern portion of the range and now provide some limited hunting. White-tailed deer inhabit some of the lower elevation lands.

Bald eagles, an endangered species, use the area during spring and fall migrations.

Small game species in the area include blue grouse and ruffed grouse. A few flocks of Merriam's turkey are found in the southern portion of the area. Numerous nongame species in the Big Snowies include mountain lion, coyote, bobcat, golden eagle, and prairie falcon.

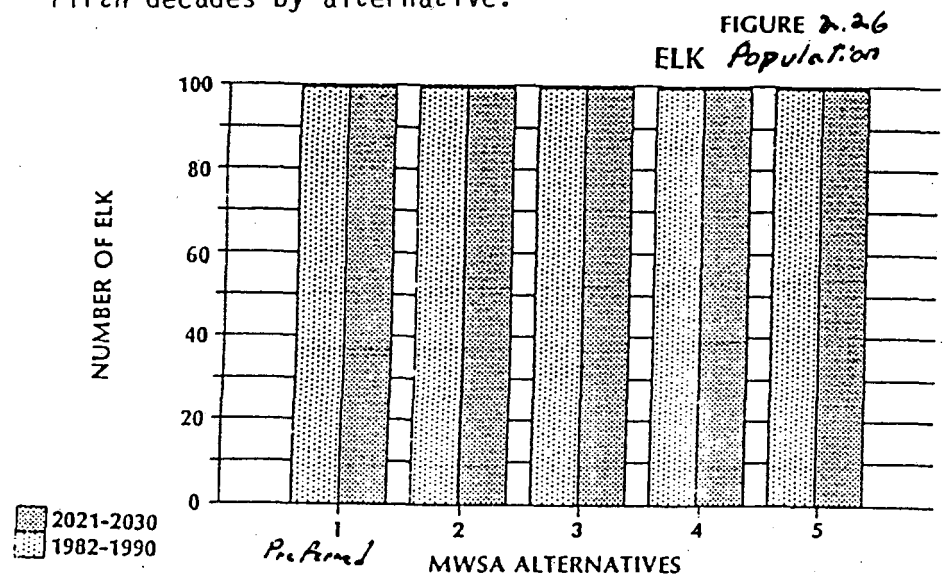
Opportunities are available for habitat improvement to enhance spring/fall ranges for deer and elk. There are no fishable streams.

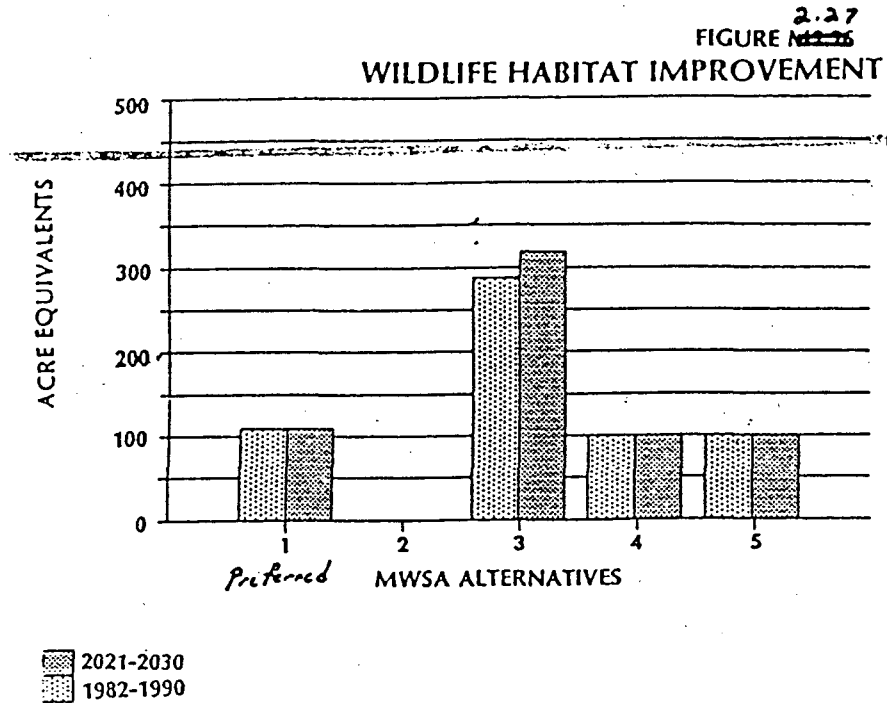
Issues

- What are the principle game, nongame, and threatened and endangered species, and what are the opportunities for habitat improvement?

Comparison

Figures 2.26 and 2.27 display elk population and wildlife habitat improvement for the first and fifth decades by alternative.





**Alternative 1
Preferred**

This alternative would favor animals that prefer late successional vegetation since there would be no timber harvest. Elk and deer security cover and hunting opportunities would be maintained. Fire and other vegetative manipulation would be used to improve spring and fall elk and deer habitat.

Alternative 2

Native wildlife species and their habitat are an integral part of the wilderness resource. Management of wildlife and wildlife habitat would be secondary to management of the wilderness resource. Wilderness classification tends to favor animals that prefer late successional vegetation.

Alternative 3

This alternative would favor animals that prefer early successional vegetation since timber harvest would be maximized. Security habitat for elk would be reduced. Hunting opportunities for both

elk and deer would decrease. Road closures would help maintain big game security.

Alternatives 4 & 5

In the upper elevations, security habitat for elk and deer would be retained since commodity production would be limited to the lower elevations. Hunting opportunities would remain the same. In the lower elevations security habitat for elk and deer would be reduced. Security habitat could be partially maintained at lower elevations by road closures.

RANGE

The forage in the study area plays an important part in supplementing local ranch operations, as well as providing feed for big game animals.

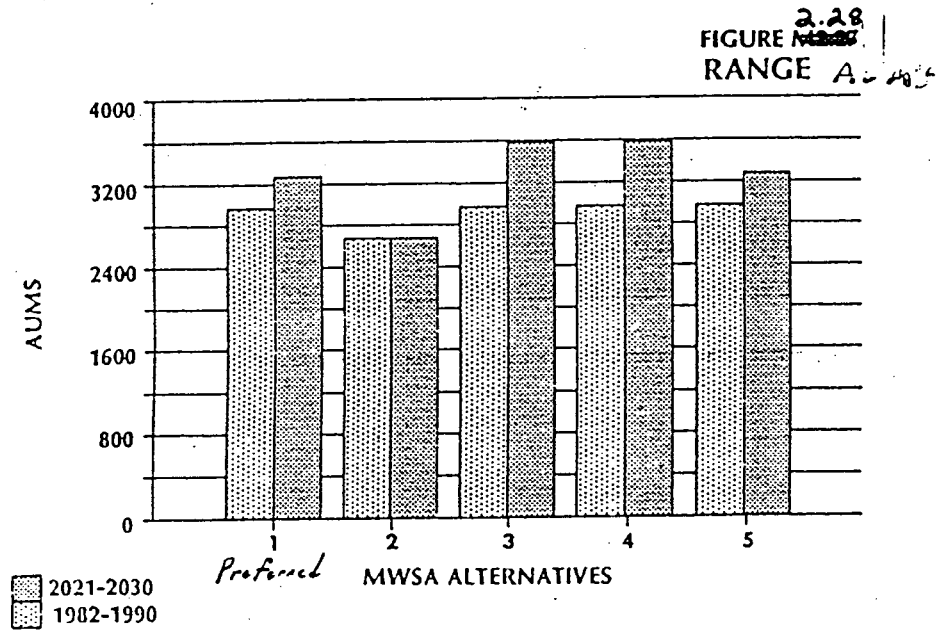
Twelve permittees have grazing permits for 867 cattle and 900 sheep annually. They graze a total of 2,200 AUMs yearly. There are 20 miles of fence and 20 spring developments on National Forest lands in the Big Snowies.

Issues

- What is the present range use of the areas, and what is the potential for that use?

Comparison

Figure 2.28 displays the number of AUMs for live-stock grazing in the first and fifth decades by alternative.



Alternatives 1 - Preferred & 5

Livestock grazing would increase by 600 AUMs, by increasing structural range improvements.

Alternative 2

Livestock grazing would not change.

Alternatives 3 & 4

Livestock grazing would increase by 900 AUMs because of transitory range from timber harvest and by increasing the structural and nonstructural improvements.

TIMBER

Approximately 50,000 acres, or 51 percent of the study area, is classified as commercial forest. Productivity is less than average for the Forest and below average for eastern Montana. Lodgepole pine and Douglas fir are the principal species. Most of the lodgepole pine stands are pole size, whereas the Douglas fir stands are sawlog size.

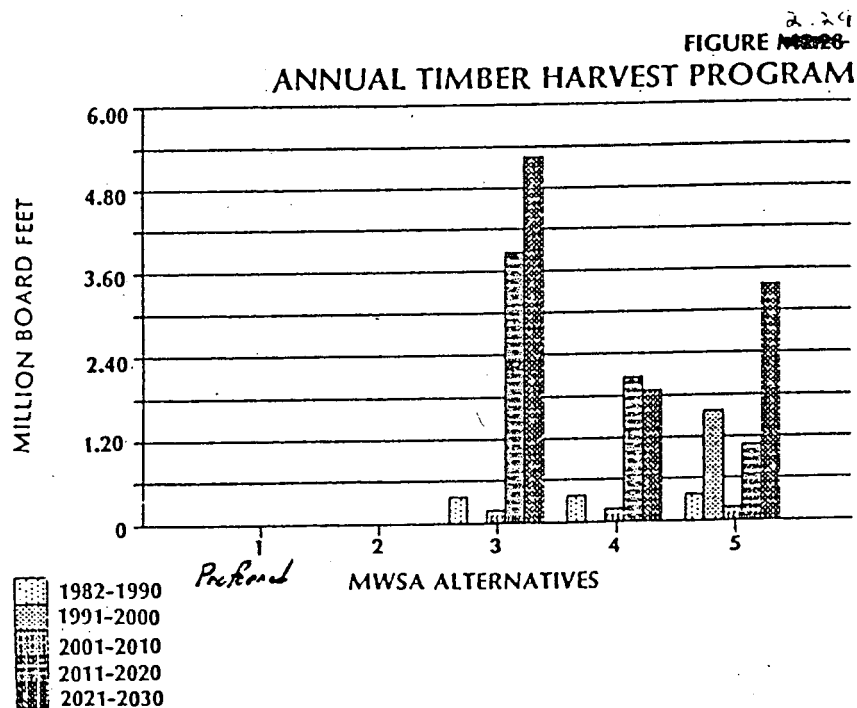
Current use for firewood is low because of limited access and distances to population centers.

Issues

- What is the timber potential of the area and where is timber management appropriate?
- What are the present use, location, and opportunities for cutting household firewood.

Comparison

Figure 2.29 displays the harvest volumes for five decades, by alternative.



- Alternative 1 Preferred** Under this alternative, no timber would be harvested on a regulated basis. Firewood, post, and pole removal would remain the same.
- Alternative 2** The Wilderness Act prohibits timber harvest. Trees would not be cut for nonwilderness purposes, with the exception of prospecting, mining, and insect and disease control.
- Alternative 3** Under this alternative, about 98 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 5.3 million board feet would be harvested annually. Additional opportunities for firewood removal would be available as roads are built and slash piles are made from logging.
- Alternative 4** Under this alternative, about 46 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 1.9 million board feet would be harvested annually. Additional opportunities for firewood removal would be available.
- Alternative 5** Under this alternative, about 67 million board feet of timber would be harvested during the 50-year planning period. By 2030, approximately 3.4 million board feet would be harvested annually. Additional opportunities for firewood removal would be available.

SOIL AND WATER

Watershed condition in the study area is generally good. The Big Snowies basins were formed by slumping at the head of larger drainages and are generally sensitive to soil disturbing activities. Other parts of the drainage are stable.

Issues

- What are the present conditions and uses of the area's watershed, and what is its relative sensitivity to development activities?

**Alternative 1
Preferred**

The watershed would remain undeveloped. Water quality would remain high. A full range of restoration practices could be used after a natural disaster.

Alternative 2

The watershed would remain essentially undeveloped. Water quality would remain high. The exclusion of motorized vehicles would, over time, return the watershed to a pristine condition. Wilderness classification would limit the kinds and extent of watershed restoration practices that would be used after a natural disaster, such as a flood or forest fire.

Alternatives 3, 4, & 5

All or part of the watershed would be developed. The stable watershed and soils make the Big Snowies suitable for roading and logging development at lower elevations. The quality and quantity of water produced would continue to provide for irrigation and livestock. A full range of restoration practices may be used after a natural disaster.

MINERALS

The past and present hardrock mineral activity has been minimal. Likewise, the potential for future activity also appears to be minimal.

The southern half of the area (approximately 50,000 acres) has a definite potential for oil and gas accumulation. This is based on recent seismic information that was made available to the Forest during the public comment period. The area is currently under application for oil and gas leases. Currently there is oil shale and mineral exploration in the Heath Shale at the foot of the range. Oil shale exploration in the Heath formation will be confined to the foothill fringe and will not directly affect the study area.

Issues

- What is the hardrock, oil, and gas potential of the area, and how should they be managed for that potential?

**Alternative 1
Preferred**

Mineral development is governed by mining and mineral leasing laws. No additional roads would be built for management of surface resources under this alternative. The area would be opened to all forms of mineral entry.

Alternative 2

Until December 31, 1983, the United States mining laws and all laws pertaining to mineral leasing apply to National Forest wilderness to the same extent as they applied to the area prior to its classification. Effective January 1, 1984, subject to existing rights, the minerals in land designated as wilderness are withdrawn from all forms of appropriation under the mining laws pertaining to mineral leasing.

Alternatives 3, 4, & 5

Mineral development is governed by mining and mineral leasing laws. Rooding would increase the opportunities to explore and develop mineral resources. The most roads would be constructed under Alternative 3, the least under Alternative 5. Under each alternative the area would be opened to all forms of mineral entry.

LANDS

The study area includes 100 acres of scattered private lands on the periphery of the study area. The study area and adjacent National Forest System lands are bound by private or BLM land.

An electronic site, under special-use permit, is on West Peak and houses communications equipment for a variety of users. Because the topography of the study areas is much higher than the surrounding area, the Big Snowies provide several ideal electronic sites. The Forest has an application pending for a second electronic site. However, no action will be taken on the application until wilderness designation has been decided by Congress. A buried waterline for livestock is under special-use permit in Halfmoon Canyon.

Issues

- What are the present landownership patterns, current access, and use? What is the opportunity for acquisition or to manage private in-holdings?
- What other energy needs, such as powerline corridors, should be considered?

All Alternatives

There would be no need to acquire any private in-holdings because any private land may be excluded by changing the study area boundary.

No need is apparent for other facilities, such as power transmission lines. Valleys to the east and west are more suitable for this use.

Under all alternatives, the electronic site and waterline may be retained, if in the opinion of the Regional Forester, their continued use would be in the public's interest.

Under Alternative 2 (wilderness), no new sites would be designated. Under the other alternatives, other special-use permits may be issued, if in the public interest.

FACILITIES -- ROADS AND TRAILS

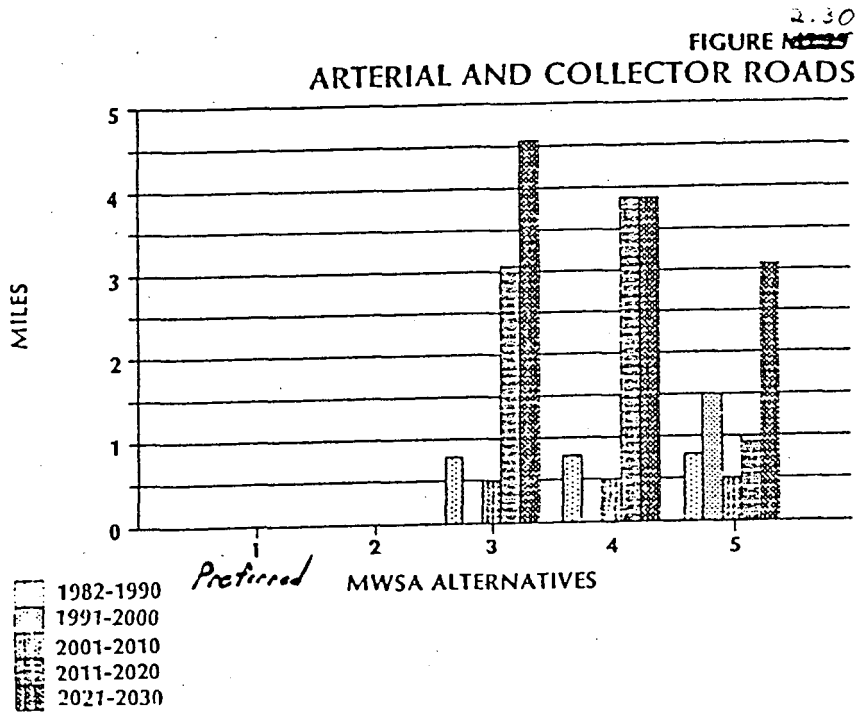
The study area contains 50 miles of low standard roads. Thirty-six miles can be negotiated with 2-wheel drive vehicles, and 14 miles require 4-wheel drive vehicles. There are 80 miles of trails in the study area. Public access through surrounding private lands is an issue, as there are only two public entry points on the south and one on the north of the Big Snowies.

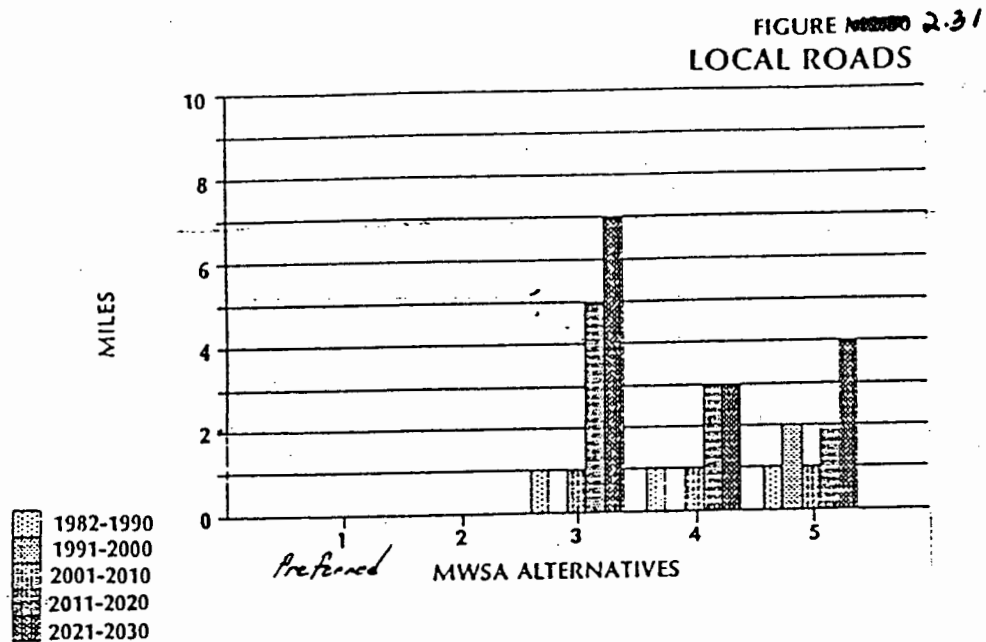
Issues

- What type, condition, and amount of road and trail access does the areas contain, and what is the potential for road access?

Comparison

Figures 2.30 and 2.31 show the miles of arterial, collector, and local roads for five decades by alternative.





**Alternative 1
Preferred**

The existing 50 miles of roads would not be maintained. The 80 miles of trails would be maintained. Approximately 20 miles of rights-of-way would be needed to access already existing trails.

Alternative 2

The 50 miles of existing roads would be closed and rehabilitated. Natural processes would be favored. All 80 miles of trail would be retained for wilderness use and management.

Alternatives 3 & 4

Under these alternatives, 90 miles of arterial and collector roads would be constructed. They would require 48 miles of rights-of-way across private land. In addition, 140 miles of local roads would be built under Alternative 3 and 80 miles under Alternative 4. Approximately 45 miles of trail would be retained under Alternative 3 and 50 miles under Alternative 4.

Alternative 5

Under this alternative, 69 miles of arterial and collector roads would be constructed. In addition, 100 miles of local roads would be built. Approximately 64 miles of trail would be retained and 16 miles would be replaced by road. Road rights-of-way across private land would be required.

PROTECTION - FIRE

All fires are suppressed as quickly as possible. As a result, there is a high accumulation of natural fuels. Fuel build-up varies from a low of 10 tons per acre to a high of 60 tons per acre. Access is limited and potential for a major burn is great during extreme fire conditions.

Issues

- What is the present condition and the potential for serious fire? What are the current protection measures and what measures are needed?

**Alternative 1
Preferred**

A Fire Management Plan, which prescribes both planned and unplanned ignitions to obtain recreation and wildlife objectives, would be developed.

Alternative 2

A Fire Management Plan, which may allow fires started by natural causes to burn within prescription, would be developed. Fire resulting from person-cause activities would be prevented and/or controlled at all times.

Alternatives 3 & 4

All unplanned fires would be suppressed. Prescribed fire with planned ignitions would be used to reduce timber harvest slash and to improve wildlife and range habitat.

Alternative 5

Prescribed fire would be used to reduce timber harvest slash and improve wildlife and range habitat. A Fire Management Plan, which uses prescribed fires from planned and unplanned ignitions will be developed to obtain recreation, range, and wildlife objectives.

**PROTECTION -- INSECT
AND DISEASE**

Currently there are no epidemic insect problems. Some epidemic mountain pine beetle infestation exists on adjacent lands, particularly to the east in the Little Snowies.

Other pests include Douglas fir beetle, spruce beetle, and spruce budworm. None of these are current threats and no major outbreaks are expected.

Issues

- What is the present condition and the potential for serious insect and disease infestation? What are the current protection measures, and what measures are needed?

**Alternative 1
Preferred**

Insect and plant disease outbreaks would not be artificially controlled unless necessary to protect timber or other valuable vegetation outside of the area.

Alternative 2

In classified wilderness, insect and plant disease outbreaks are not artificially controlled unless necessary to protect timber or other valuable vegetation outside wilderness.

Alternatives 3, 4, & 5

Vegetation management would be directed to reduce losses from insect and plant disease on those lands that were developed. On lands that remain in a semi-primitive recreation setting, insect and plant disease outbreaks would not be artificially controlled unless necessary to protect timber or valuable vegetation outside of the area.

**QUANTITATIVE
ECONOMIC COMPARISON**

Issues

- What resources does the area contain, and how should the study area's resource outputs be allocated toward meeting the RPA program goals?
- What considerations should be given to maintaining current employment levels for dependent communities?

The Big Snowies Wilderness Study Area is in Fergus and Golden Valley counties. These counties are dependent on farming and ranching, although Lewistown is a small service center for central Montana. Golden Valley County is projected to have a slight decrease in population over the next 20 years, while Fergus County is projected to have a slight increase.

National needs for goods and services are reflected in the objectives assigned to the Lewis and Clark National Forest by the RPA (Resource Planning Act) Program. Table 2.7 displays some of the contributions the Big Snowies makes in providing recreation, range, timber, and wilderness needs.

Benefits

Benefit values were assigned to market outputs and selected nonmarket outputs. Dollar values were assigned to benefits from timber, range, recreation, and oil and gas leasing. Only lease rental rates were used for computing mineral values. There are no estimates available for hardrock mineral values or oil and gas royalty values. These values are discussed under costs and benefits in the Alternative Formulation at the beginning of this chapter.

Return to U.S. Government

This is the revenue the Forest collects and returns to the U.S. Treasury from timber sales, grazing fees, timber purchaser's road credits, sale area improvement collections, recreation fees, mineral leasing, and land use charges.

Return to State

By Federal law, 25 percent of this revenue is returned to the state for use by the counties for schools and roads. Counties' shares of the payment are determined by the acreage of National Forest within the county. In addition, counties receive PILT (payment in-lieu of taxes). PILT ranges from 10 cents to 75 cents per acre.

Costs

Forest Service costs are estimated for each alternative.

Table 2.8 displays the benefits and costs of the alternatives.

TABLE 2.8
BIG SNOWIES
ANNUAL BENEFITS AND COSTS
(Thousand Dollars)
(Values Given In 1978 Dollars)

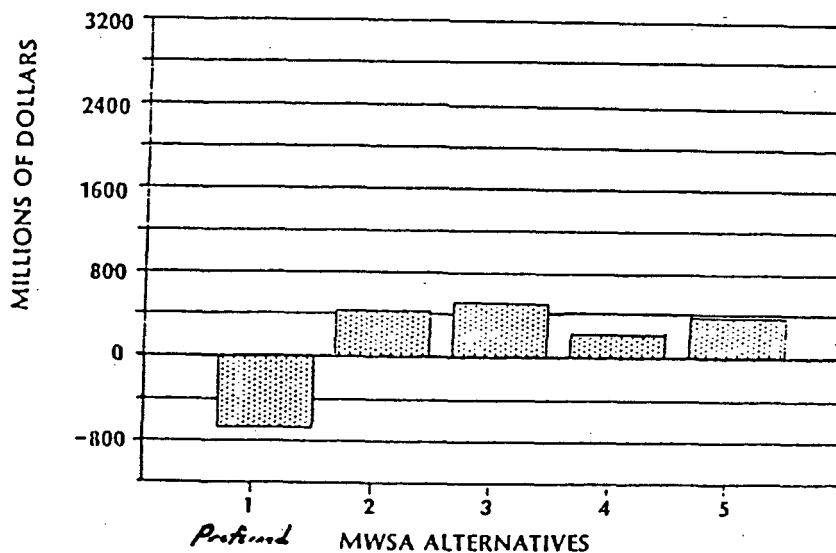
<u>DECADE</u>	<u>ALT</u> <u>1</u>	<u>ALT</u> <u>2</u>	<u>ALT</u> <u>3</u>	<u>ALT</u> <u>4</u>	<u>ALT</u> <u>5</u>
<u>1982-1990</u>					
Total Benefits	73.1	92.5	179.4	179.6	179.6
Returns To US Govt.	52.4	4.9	60.4	60.4	60.4
Total Costs	111.0	83.6	165.4	165.6	165.6
Total Net Benefits	-37.9	8.9	14.0	14.0	14.0
<u>1991-2000</u>					
Total Benefits	86.0	99.9	86.2	86.2	483.0
Returns To US Govt.	52.4	4.9	52.4	52.4	84.4
Total Costs	118.6	82.0	119.0	119.2	192.1
Total Net Benefits	-32.6	17.9	-32.8	-33.0	290.9
<u>2001-2010</u>					
Total Benefits	93.6	108.2	145.4	145.0	143.0
Returns to US Govt.	52.4	4.9	130.7	94.7	74.7
Total Costs	120.9	82.0	137.4	137.1	135.3
Total Net Benefits	-27.3	26.2	8.0	7.9	7.7
<u>2011-2020</u>					
Total Benefits	100.5	115.6	1065.6	619.4	372.2
Returns to US Govt.	52.4	4.9	130.7	94.7	74.7
Total Costs	120.9	82.0	258.5	236.5	171.0
Total Net Benefits	-21.5	33.6	807.1	382.9	201.2
<u>2021-2030</u>					
Total Benefits	106.2	123.9	2402.5	579.1	943.8
Returns to US Govt.	52.4	4.9	159.5	71.5	120.7
Total Costs	123.3	82.0	315.8	240.0	277.7
Total Net Benefits	-16.4	41.9	2086.7	339.1	666.1
PNV @ 4%	-677.4	427.7	558.1	151.2	341.0

PRESENT NET VALUE

PNV (present net value) is an economic evaluation tool used to examine the economic differences between alternatives. PNV is the discounted benefit less discounted costs associated with providing all resource outputs to which monetary value can be assigned, including both market and selected nonmarket outputs. PNV was calculated over a 50-year planning horizon because cost and benefit data were not available beyond this first 50 years for this area. The costs and benefits used in this calculation are mentioned in Alternative Formulation at the beginning of this chapter. Figure 2.31 displays PNV for each alternative. There are no values available for hardrock mineral or oil and gas production rates, because little is known on the future production potential.

The allocation and scheduling of acres to management prescriptions for each alternative was done by maximizing PNV in FORPLAN. This satisfied NFMA regulations which require each alternative represent the "most efficient combination of management practices examined that can meet the objectives established in the alternatives."

FIGURE 2.32
PRESENT NET VALUE



**Alternative 1
Preferred**

Alternative 1 has a negative PN_V due to no revenues received from timber harvesting and recreation being valued as dispersed and hunter recreation at \$3.00/RVD and \$21/RVD, respectively. The only commodity which generates revenue is range. This leads to a negative PN_V because the benefits assigned to recreation RVDs (both dispersed and hunting) and grazing do not exceed the costs for operation and maintenance at that level of recreation and grazing.

Alternative 2

Alternative 2 ranks higher than Alternative 1 because of wilderness classification. This classification assigns a high value to primitive (wilderness) recreation (\$8.00/RVD). Therefore, benefits from recreation are much greater than those from Alternative 1.

Alternatives 3, 4, & 5

Under these alternatives, PN_V is higher because of timber harvesting. PN_V increases in proportion to the increases in timber harvesting.

EMPLOYMENT AND INCOME

Tables M2.9 and M2.10 display employment and income changes. These changes are based on increases in timber harvest and grazing levels. Projections were made based on an input/output model used for Forest Plan alternatives. The input/output model is described in the planning record, "Input/Output Model". The magnitude and effects of these changes are discussed in Chapter IV.

TABLE 2.9
EMPLOYMENT CHANGES FROM CURRENT PLAN
(PEOPLE)

	1	2	3	4	5
1982-1990	0	0	5	5	5
1991-2000	0	0	0	0	20
2001-2010	0	0	3	3	3
2011-2020	0	0	50	30	15
2021-2030	0	0	70	25	45

TABLE 2.10
INCOME CHANGES FROM CURRENT PLAN
(THOUSANDS OF DOLLARS)

	1	2	3	4	5
1982-1990	0	0	80	80	80
1991-2000	0	0	0	0	300
2001-2010	0	0	40	40	40
2011-2020	0	0	730	390	210
2021-2030	0	0	990	360	640

**COMPARISON OF
QUALITATIVE NET
PUBLIC BENEFITS**

Introduction

The interdisciplinary team evaluated the alternatives to determine which alternative maximized net public benefit. Net public benefit is important since it represents the overall value to the nation of all benefits less all costs, regardless of whether the costs and benefits are expressed in priced (PNV) or non-priced terms (often subjectively measured). The PNV component of each alternative's net public benefit is displayed in Table 2.8.

Each alternative is compared as to how well it addresses the non-priced components of net public benefit. The non-priced components of net public benefit include:

- 1) Elk Hunting Quality -- The quality of big elk hunting varies by alternative. Currently elk hunting quality indicators include the length of the hunting season and the population structure of the animals harvested. Both quality indicators are influenced by the currently unroaded situation on the study area. Timber harvesting on elk hiding cover areas would have varying impacts on elk hunting quality. Each alternative was examined to determine its impact on elk hunting quality and whether or not the PNV trade-offs are acceptable.
- 2) Semi-Primitive Recreation Setting -- According to public involvement comments the maintenance of a semi-primitive recreation setting in certain parts of the Forest is important. The Big Snowies is highly valued for its semi-primitive recreation opportunity.
- 3) Visual Quality -- Visual quality constraints have been included in the FORPLAN runs and therefore reduce the PNV. Whether the benefits produced exceed the costs is a subjective component that needs to be considered in the non-priced net public benefit analysis.

4) Posts, poles and firewood -- The opportunities for local people, ranchers, and small businesses to cut posts, poles, and/or firewood are not valued in the PNV. These opportunities vary by alternative.

Ranchers are also dependent on the current level of grazing. The stability for ranching lifestyle is not considered in the benefits assigned to livestock AUMs. This factor needs to be considered and weighed against any grazing inefficiencies.

**Alternative 1
Preferred**

Alternative 1 would maintain the quality of elk hunting. The population structure should be maintained or improved through habitat improvement practices. Timing restrictions would prevent major disturbances to elk by oil and gas development.

The Big Snowies would maintain its semi-primitive recreation setting. Both motorized and non-motorized recreation would be permitted.

Visual quality would not be affected.

The opportunity to cut posts, poles, and/or firewood would not change. Because grazing levels would increase slightly, the ranching lifestyle would be maintained.

Alternative 2

Alternative 2 would maintain the quality of elk hunting. No timber would be harvested. Grazing would not increase.

There would be no opportunity for mineral entry after January 1, 1984.

The Big Snowies would be managed as wilderness (primitive recreation setting). Motorized recreation would not be permitted.

Visual quality would not be affected.

The opportunity to cut posts, poles, and/or firewood would be foregone. Maintaining grazing at current levels would not affect the ranching lifestyle.

Alternatives 3 & 4

Alternatives 3 and 4 would drastically lower the quality of elk hunting. Because most of the lands would be accessed for timber, hiding cover would be reduced. With less hiding cover, animals would be harvested quickly and fewer mature animals would be available.

The opportunity for mineral exploration would increase with increased access. The effects of mineral development are not expected to have major impacts on other surface resources.

Alternative 3 would not retain any of the area in a semi-primitive recreation setting. Alternative 4 would retain 16,000 acres in a semi-primitive recreation setting.

Alternatives 3 and 4 affect visual quality the most. They contain the most acres in the modification class.

The opportunity to cut posts, poles, and/or firewood would increase. Increasing the level of grazing would ensure a stable ranching lifestyle.

Alternative 5

Alternative 5 would slightly lower the quality of elk hunting. The lower Big Snowies would be accessed. The upper lands would remain undeveloped. Timber harvest would cause some easier and quicker access to elk.

Alternative 5 would retain 39,100 acres in a semi-primitive recreation setting.

Alternative 5 would affect the visual quality on 58,800 acres.

The opportunity to cut posts, poles, and/or firewood would increase slightly. The slight increase in grazing would help maintain a stable ranching lifestyle.

The effects of mineral exploration and development are not expected to effect other surface resources.

FEIS
MONTANA WILDERNESS
STUDY ACT AREAS

CHAPTER III
AFFECTED ENVIRONMENT

Overview

This chapter briefly describes the various environments of the Montana Wilderness Study Areas which would be affected by the alternatives. Chapter IV, Environmental Consequences, describes how the alternatives effect the environments.

The first portion of this chapter deals with the Middle Fork Judith, the second portion with the Big Snowies.

GENERAL DESCRIPTION

The Middle Fork Judith Wilderness Study Area is in Judith Basin, Cascade and Meagher Counties. It encompasses 92,000 acres about 16 miles long and 9 miles wide. Its boundaries are defined by roads, mines, and hydrological divides. The area contains most of the Middle and Lost Forks of the Judith River. Prominent landscape features are the head-water basins of these two streams. Elevations range from 5,000 to 8,500 feet. At the higher elevations, the mountains are blanketed with lodgepole pine; Douglas fir predominates at the lower elevations. Pockets of spruce are found amidst the Douglas fir and along the creek bottoms. White bark pine and subalpine fir are found on poorer growing sites and at higher elevations.

Except for 1,154 acres along the Middle Fork of the Judith and 194 acres of small tracts along the west and north boundaries, the study area is federally owned and managed by the Lewis and Clark National Forest.

For the most part, the topography is gentle to moderate rolling, with open parks and stringer type meadows. These are punctuated with limestone cliffs and outcrops. In the eastern portion of the study area, narrow and picturesque multicolored limestone canyons offer a unique geologic feature that cannot be found in the immediate vicinity.

The area also abounds in history and lore. Western artist Charles Russell painted and wrote about many of the places in this area. The Yogo Sapphire mines (the sapphires in the Crown Jewels of England were mined there) are just outside the northern boundary of the study area. Old Yogo Town, where the discovery of gold started a gold rush, is adjacent to the study area. Indians frequented the area even before the miners and left evidence of their presence. Even earlier history is recorded in the numerous limestone cliffs containing fossils of early sea and animal life.

RECREATION**Dispersed Recreation**

The major recreation activities are big and small game hunting and fishing along the Middle and Lost Forks. These activities are expected to remain the major recreation activities in the future. Hunter camps, although found throughout the study area, are concentrated along the Middle and Lost Forks. Because of the numerous primitive roads, hunters tend to use 4-wheel drive vehicles rather than horses. However, local outfitters still use horses.

Backpacking is limited and usually consists of day hikes by fishermen and hunters. Approximately 10,800 RVDs of nonmotorized recreation takes place annually.

Motorized Recreation

Use of 4-wheel drive vehicles and trail vehicles is extensive and extremely popular. There are about 75 miles of trails. No doubt, some of the steep hills are well suited for testing the capabilities of the trailbike and its driver. In addition, approximately 52 miles of primitive roads are passable, for the most part, only by 4-wheel drive vehicles. These roads are not confined to gentle ridges and valley bottoms, but cross steep ridges, muddy areas, and narrow canyons. The Middle Fork road follows the river bottom most of its length and fords the creek numerous times. Besides primitive roads, about 12 miles of low standard roads are useable by pickup trucks. Occasionally aircrafts land in the lower Lost Fork area as well as at the primitive airstrip in Cleveland Creek. Motorized recreation accounts for about 10,000 RVDs, yearly.

Scenic Beauty

Ridgetops and Yogo Peak, the highest point offering the most spectacular view of the area, can be reached by a combination of roads and a short hike. Multicolored, narrow limestone canyons in the eastern end of the study area draw many recreationists to the area.

Winter Use

During the winter some snowmobiling and cross-country skiing take place. Both activities are limited by poor access and rugged terrain. Nevertheless, approximately 800 RVDs of non-motorized recreation and 1,800 RVDs of motorized recreation do take place during the winter.

WILDERNESS**Wilderness Character**

The Middle Fork Judith Study Area is essentially a natural environment. The topography is varied and scenic. It is rolling and gentle in some areas and rugged in others. The study area for the most part has retained its original character, and man's influence, with a few exceptions, has been minimal. The sights and sounds of man can, and do, penetrate the area.

Trails throughout the study area, unimproved roads on ridges and valley bottoms, livestock grazing along stream bottoms, sheep grazing on the ridges, pasture and drift fences along the Middle and Lost Fork bottoms, and structural developments on private land are present and affect the quality of the natural environment on approximately 15 percent of the study area.

Opportunities exist for primitive types of recreation, such as fishing and hunting, which are popular in the study area. Most of this activity is concentrated in relatively few locations. The greatest hunting pressures are on ridges that can be accessed with 4-wheel drive vehicles and the Middle and Lost Forks. Most fishing is also done in the Middle and Lost Forks and their major tributaries. Backpacking is relatively limited and is usually day hiking by fishermen and hunters. There are opportunities for cross-country skiing, but due to poor access and rugged terrain, little is done. Compared to other areas in the Little Belts, the study area rates average or below average for primitive recreation use.

Scenic Beauty

There are several vista points in the study area. One of the most spectacular views of the area is from Yogo Peak. Although it is the highest point, it is on the boundary and can be reached via 2-wheel drive vehicle and a 1/4 mile hike. The valleys can also be seen from the frequent meadows along gentle ridgetops. Many of these ridges can be reached by 4-wheel drive vehicles and trailbikes. All but 10 miles of these roads have been recently closed to such use. There are also multicolored, rugged, narrow limestone canyons in the eastern end of the study area.

Solitude

Opportunities for solitude are available in the study area. These opportunities can be marred by the concentrations of people in the canyon area, particularly in the Middle and Lost Forks.

Apparent Naturalness

Compared to other areas in the Little Belts, portions of the Middle Fork Judith Study Area rate as average or below average for apparent naturalness. Man's influence is most apparent in three geographic areas on the boundary of the study area.

The first, the Weatherwax/Harrison Creek area, is on the southwestern edge of the study area. Timber was harvested in two areas in the late 1960s and early 1970s. As a result, there are approximately 13 clearcuts and 4.6 miles of high standard roads. A summer home, a major powerline, and mineral exploration areas are also included in this part of the area study area. These impacts are readily apparent.

The second area, Grendah Mountain, is on the western edge and has been used for mineral exploration and small scale mining for silver, gold, and lead since the late 1800s. These impacts are readily apparent.

The third area, Yogo Peak, like Grendah, has had intensive mineral prospecting and small scale mining. Located on the northern boundary, it encompasses the old mining town of Yogo Town, four patented claims occupying about 80 acres, and more than 30 unpatented claims. Recently, extensive mining for molybdenum has taken place. These activities and developments have been accompanied by roads. These impacts are readily apparent.

WILDLIFE AND FISH

A variety of wildlife use the Middle Fork Judith Wilderness Study Area. The study area provides habitat for elk, mule deer, grouse, and black bear. Limited numbers of white-tailed deer and mountain lion are found in portions of the area. Nongame species include wolverine, lynx, golden eagle, and prairie falcon.

T. & E Species

Bald eagles, an endangered species, are occasionally seen during spring and fall migrations, but are not known to nest in the area. Suitable, unoccupied nesting habitat for peregrine falcon has been identified at the confluence of the Lost Fork and Middle Fork of the Judith River. However, there are no reports of peregrines in the study area in recent years.

Elk

Elk are well distributed throughout the study area. They were planted in the Little Belt Mountains in 1915 and again in 1928 and have done extremely well. The herd has been one of the most prolific in the state, at times having a cow-calf ratio of over 50 percent. Elk numbers are now estimated at 1,200 elk. Spring/summer/fall range for elk is found throughout the area. During the fall, elk migrate across the northeastern portion of the study area to the winter range on the Judith River Game Range. This State-operated game range is adjacent to the eastern edge of the study area.

Wildlife Habitat

Opportunities are available to maintain or improve spring/fall ranges for elk and mule deer at lower elevations in the eastern portion of the area. Since elk and deer require early stages of plant succession for much of their food, prescribed burning or other methods of vegetative manipulation would be needed to maintain early successional stages.

Fish Habitat

Some limited opportunities for fish habitat improvement exist on the larger streams. Most of the streams in this area support a small population of native trout; however, the accessible streams are usually supplemented with hatchery fish to increase fisherman success. The Middle Fork and its main tributaries provide over 29 miles of fisheries for cutthroat and rainbow trout. The upper Lost Fork contains a strain of native cutthroat.

RANGE**Grazing**

The study area contains approximately 9,800 acres of suitable livestock range. Currently, 900 AUMs are permitted for livestock. Five permittees graze 250 cattle or horses annually. One active term grazing permit for sheep is in the area. A new allotment management plan for the sheep grazing area is under preparation.

The forage in the study area plays an important part in supplementing local ranch operations, as well as providing feed for big game animals, particularly elk. The majority of the range is natural parks, meadows, or grasses along streams.

Competition

Previously, keen competition between elk and cattle for forage has existed, especially along the Middle and Lost Forks. Intensive range management, which uses deferred and rest rotations grazing systems, has improved the range and mitigated some of the forage competition.

Improvements

On the current allotments, there are 10 miles of fence and 5 spring developments within the study area.

TIMBER**Commercial Forest**

The lower elevations and foothills of the study area are blanketed with Douglas fir; at higher elevations, lodgepole pine is predominant. Although Douglas fir and lodgepole pine are the principle species, spruce can be found in small patches along the creek bottoms and ponderosa pine on the dryer slopes. Whitebark pine and species such as subalpine fir are found on poorer growing sites and in the subalpine region. Approximately 53,500 acres, or 59 percent of the area, is classified as commercial forest land. The Middle Fork Judith has a standing volume of 460 million board feet.

Timber Sales

Since wilderness study began, no timber sales have been programmed within the study area. Past timber harvesting has taken place adjacent to the Middle Fork Ranch and in the Weatherwax/Harrison Creek area.

Productivity

Site productivity is average when compared to other sites on the Lewis and Clark National Forest. The areas most suitable for timber management are in the upper basins of Middle Fork and Lost Fork. The other areas have steep and rocky terrain, which would require an extensive road system and long adverse hauls, making it difficult to harvest wood products.

Firewood

Present use for firewood cutting in the Middle Fork Judith is low due to limited and difficult access.

SOIL AND WATER**Soils**

Watershed condition in the study area is generally good. The Middle Fork Judith has a very stable watershed and is relatively insensitive to roading or logging.

Climate

The climate is characterized by constant winds and sudden changes in temperature. The annual precipitation, mostly snow, ranges from 16 inches in the lowlands to 22 inches at the higher elevations. Warm chinook winds help break the occasional cold spells and reduce accumulated snowfall. The majority of the rain comes in May and June.

Water

The Middle Fork of the Judith River is the only year round stream which flows from the eastside of the Little Belt Mountains. The stream runs in an easterly and northeasterly direction, and flows into the Judith River which drains into the Missouri River. The upper Judith River Watershed has an average discharge of 50.1 cubic feet/second just below the Forest boundary. Farmers and ranchers are dependent on this mountain water supply for irrigation, livestock, and household use. Of these, irrigation during the mid- and late summer is the largest use. Water is also provided for Ackley Reservoir, which was built in 1938 for irrigation and serves about 6,000 acres.

Water Storage

No known water storage projects are planned in the study area and the potential for such a project is low or non-existent.

MINERALS**Geology**

In general, the geology of the study area consists of thick bedded, massive, tan colored limestone and dolomites of the Devonian Jefferson Formation and the Mississippian Madison Group. The carbonate rocks were deposited in a marine environment from 300 to 400 million years ago. Beginning about 70 million years ago, a mountain building episode known as the Laramide Orogeny produced the Little Belt Mountains. The entire area was domed up, with the Neihart-Moose Creek area forming the core of the dome. Igneous rocks intruded into the existing sedimentary rocks and significant deposits of silver, lead, and zinc were formed. The flat-lying sedimentary rocks of the Lost and Middle Fork area were gently tilted toward the east. Subsequent erosion by the Lost and Middle Fork of the Judith River produced the landscape we see today.

Claims

There are approximately 150 prospects and mines within the study area. Private land (patented mining claims) totals about 194 acres.

Development

Since the late 1800s, small scale mining for silver, gold, and lead has taken place. An abandoned mining town, Yogo Town, lies along the northern border of the study area.

Yogo Peak and Grendah Mountain continue to be areas with mineral activity. These two areas have undergone a variety of mineral development including claiming, exploratory drilling, geophysical surveying, and minor production. Continued exploration and production can be expected in the future.

Opportunities

The famed Yogo sapphire deposit lies partially in the northeast corner of the study area. This sapphire-bearing rock extends from the American mine on Yogo Creek into Kelly and Richard Coulee. Here, sapphire mining has been sporadic depending on market prices. Exploration of the possible extension of the sapphire bearing rock into the study area is expected in the future. High quality gem sapphires would continue to be produced. Mineral development opportunities still exist on Grendah Mountain, Yogo Peak, and at the head of the Lost Fork.

Evidence indicates that lead, silver, and molybdenite still exist in quantity, but at long distances from milling sites. Present prices and the haul distance over poor roads restrict the development of these areas. Placer gold occurrences along portions of Yogo, Lead, and Boulder Creeks could also be of significant importance. Building stone operations are also possible in the vicinity of Yogo Peak. Little or no oil and gas potential exists within the study area. About 4,770 acres are under consideration for oil and gas leasing.

LANDS**Private Land**

There are 1,154 acres of contiguous private in-holdings in private ownership in the Middle Fork and 194 acres in smaller patented mineral claims on the west and north boundary. Major uses of this private land is grazing, dude ranch headquarters, and recreational use. The Forest is currently studying a land exchange for part of the private lands.

FACILITIES**Access**

Access is possible via ridge roads to mineral claims and by primitive roads over Studhorse Hill and in and out of stream channels to the private in-holdings. The study area contains 52 miles of primitive roads, 12 miles of low standard roads, and 75 miles of trails. Currently, the road system which accesses the study area is inadequate. It does not provide for good connections to the present trail system or good user distribution.

Energy Corridors

One transmission corridor passes through the southwestern corner of the study area. There are no plans for other corridors.

PROTECTION**Fire**

Most of the study area is composed of old growth stands and the occurrence of natural fuel is high. Given extreme fire conditions, a fire ignited in heavy fuels would probably burn an entire drainage.

Insect & Disease

Mountain pine beetle and western spruce budworm pose the greatest threat in the study area. Old growth lodgepole pine stands are the most susceptible to mountain pine beetle. This beetle reached epidemic levels in 1964 and has persisted since then. About 6,360 acres have been classified as highly susceptible to the mountain pine beetle. Although Douglas fir beetle and spruce have not been a problem in recent years, the potential does exist for an outbreak in both Douglas fir and Engelmann spruce. The risk should remain low unless there is extensive windthrow of these two species. Spruce budworm is presently not a problem. However, this area was heavily infested in the early 1950s and 1960s. Destructive populations could rebuild. Should an insect epidemic occur, mortality would compound fire potential conditions.

**SOCIAL AND ECONOMIC
ENVIRONMENT**

The Middle Fork Judith Wilderness Study Area is in Judith Basin County. Like most of the area-of-influence, Judith Basin County is heavily dependent on farming and ranching. It has a stable population, which is projected to have a slight decline over the next 20 years.

The Middle Fork Judith is within a day's drive of the population centers of Great Falls, Lewistown, Helena, and Billings. It is also close to local wood processing plants, especially White Sulphur Springs which is about 30 miles to the southeast. Local ranchers graze cattle and sheep in the area during the summer-fall months.

Recreational users of the study area generally come from the local area. In the hunting season the study area attracts users from a wider area and out of state.

SOCIAL TRAITS

A vital component of the social base line data is the social traits of a community that can be measured and are judged to be potentially affected by activities of the Forest. Three traits have been selected as important indicators of effect on local communities. These social traits are:

**Sense of Control/
Self Sufficiency**

-- The feeling that one has control over one's life direction; not subject to control by people outside the community.

Symbolic Meaning

-- The emotional and rational attachment one has on places and things on or from the Forest.

**Emotional/Spiritual
Renewal**

-- The revival or reestablishment of certain emotional and/or spiritual levels as related to wildlands; a state of mind characterized by calmness, quietness, and tranquility; escape from excessive stimuli.

GENERAL DESCRIPTION

The 97,885 acre Big Snowies Wilderness Study Area is within Fergus and Golden Valley Counties. The study area is all federal land except for 100 acres of private land scattered around the periphery of the Snowies. The Crystal Lake area (approximately 2,000 acres) was not included in the study area because of developments including two trailheads, a boat ramp, a picnic area, a campground, a cabin, and a paved road. Private and BLM lands surround the study area. The Big Snowy Mountains are uplifted tilted limestone beds which were thrust to elevations over 8,600 feet from the surrounding 5,000 foot plains. The mountains form a flattopped ridge. Round basins were weathered away in the limestone resembling cirque basins created by glaciers, giving the area unique geologic features. Most of the side slopes are steep. At the higher elevations side slopes are bare and rocky. Lower down they are forested. The southeast corner has gentler forested slopes.

Southeast of the study area is the Twin Coulee Unit administered by the BLM (Bureau of Land Management). This 6,870 acre, heavily timbered, unroaded area has been studied by the BLM for wilderness classification and has been recommended unsuitable for wilderness. As planning began, the agencies intended to use a cooperative interagency planning effort and study the Big Snowies and Twin Coulee areas together. But the BLM later determined that the Twin Coulee area might have a greater mineral potential than earlier thought. Needing more time and also support from the U.S. Geological Survey to determine the mineral potential, the BLM decided to include the wilderness study of the Twin Coulee Unit as part of the Billings Resource Management Plan. (For a copy of the draft EIS write: Bureau of Land Management, 222 North 32nd Street, P.O. Box 30157, Billings, MT 59107.)

RECREATION**Dispersed Recreation**

Day hiking, backpacking, hunting, and trailbike riding are the most popular activities. Annual nonmotorized recreation use is about 4,000 RVDs. Lack of water, especially along the crest, is the limiting factor to extended backpacking trips. No designated campsites or facilities exist. The Crystal Lake area provides the only developed campground adjacent to the study area.

Trails

Eighty miles of maintained trails provide access to key features. These are primarily hiker and horse trails; however, some motorcycles do enter the area. Only trails on the south side are opened to motor vehicles. Access through private land is extremely limited.

The Halfmoon and Swimming Woman Trails have been nominated for inclusion in the NeeMePoo National Recreation Trail which commemorates the route taken by the Nez Perce Indians in their flight toward Canada.

Motorized Recreation

In addition to the trails, there are 14 miles of primitive roads used by 4-wheel drive vehicles and 36 miles of low standard roads usable by 2-wheel drive pickups. Almost every stream bottom on the periphery has some low standard road which penetrates into the study area for varying distances. Annual motorized recreation use is 1,700 RVDs, or about 30 percent of the use.

Special Areas

Principal attractions in the study area include caves, such as Ice Cave and Devil's Chute, and Crystal Cascades. The Ice Cave and Devil's Chute are on the west end of the main ridge. Crystal Cascades is southeast of the campground. There are several unexplored caves in the limestone formations. Fossil hunting is popular and extensive old lake deposits on the uplifted plateaus yield excellent specimens.

Scenic Beauty

The alpine and tundra vegetation on the crest and canyon wall, along with unique rock formations and cliffs, are scenic attractions. Unobstructed views of surrounding plains, agriculture lands, and distant mountain ranges present opportunities for pleasure viewing and photography.

WILDERNESS**Wilderness Character**

The majority of National Forest System lands in the Big Snowy Mountains shows little evidence of use by humans. The study area boundary excludes most major developments. The study area is a rectangular tract of some 150 square miles. The area offers scenic vistas of much of central Montana including seven different mountain ranges, some over 100 miles away. Opportunities for solitude and primitive recreation pursuits are high, though core-to-perimeter distances rarely exceed four miles. There is a feeling of isolation when traveling up the narrow valleys; the crest gives a "top of the world" sensation.

Apparent Naturalness

Impacts on apparent naturalness and natural integrity are confined to three principal geographic areas. The first area is Blake Creek, Timber Creek, Careless Creek, and Swimming Woman Creek drainages, in the south half of the Snowies, where timber harvest has occurred. Included are five clearcut units and about five miles of low standard road associated with timber harvest. These areas were harvested in the 1960s and have since been reforested. The roads are still driveable. Several old mine shafts are in the Swimming Woman Creek and Careless Creek drainages. These impacts are readily apparent.

The second area is an electronics site on West Peak, which includes several buildings, antennas, generators, and radio equipment. The site is less than an acre and is visible from several locations along the western third of the study area.

The third area is a small area in Greenpole Canyon, where timber was harvested in the early 1960s. The area is in the northwestern part of the study area and includes about one mile of low standard road. The harvested lands have been reforested. The roads associated with the harvest are still being used. These impacts are readily apparent.

WILDLIFE AND FISH

Major big game species in the Big Snowies are mule deer, black bear, and mountain goat. Elk numbers have been increasing gradually in the northern portion of the range and now provide some limited hunting. White-tailed deer inhabit some of the lower elevation lands.

T & E Species

Bald eagles, an endangered species, are known to use the area during spring and fall migrations. The only other endangered species possibly using the area is the peregrine falcon. No recorded observations of peregrines have been made in recent years and no suitable unoccupied habitat has been identified.

Small Game Species

Small game species in the area include blue grouse and ruffed grouse. A few flocks of Merriam's turkey are found in the southern portion of the area. Numerous nongame species in the Big Snowies include mountain lion, coyote, bobcat, golden eagle, and prairie falcon.

Wildlife Habitat

Opportunities are available for habitat improvement to enhance spring/fall ranges for deer and elk. Early successional stages in the extensive burned over areas in the southern portion of the Big Snowies could be maintained by prescribed burning or other methods of conifer regeneration suppression.

Fish Habitat

Fishable streams are few. Most streams are intermittent and too steep to support fisheries. Halfmoon, Cottonwood, and Swimming Woman Creeks provide, in total, about 10 miles of cutthroat fisheries. Fish rarely exceed "pan size."

RANGE**Grazing**

Twelve permittees have annual grazing permits for 867 cattle and 900 sheep. They graze a total of 2,700 AUMs yearly. There are 20 miles of fence and 20 spring developments on National Forest lands in the Big Snowies. Not all of these are within the study area; however, these improvements are all part of range allotments that are in part within the study area.

Opportunities

The study area could provide an additional 1000 AUMs of livestock grazing. Increases are dependent on water developments and fence construction. Water is the limiting factor for increasing livestock within the area. Up to 10 water developments and 5 to 10 miles of fence would be required to accomplish these increases.

TIMBER**Commercial Forest**

Approximately 50,000 acres, or 51 percent of the study area, is classified as commercial forest. Productivity is less than average for the Forest and below average for eastern Montana. Lodgepole pine and Douglas fir are the principal species. The Big Snowies has a standing volume of 317 million board feet.

Most of the commercial forest is in the canyon bottoms and western slopes. The lack of access into these areas is the greatest limitation to timber harvest. Right-of-way presents a problem because the Big Snowies is almost completely surrounded by private property. Steep slopes, cliffs, and marginal timber sites have precluded harvesting in other areas.

Timber Sales

No sales have been programmed within the study area since the area was put in wilderness study area status.

Firewood

Current use for firewood is low because of limited access. Most of the trees are relatively young and small with no extensive areas of easy to reach firewood. Future firewood use should be relatively low because other forest areas provide better gathering areas on gentler ground.

SOIL AND WATER**Soils & Water
Quality**

Most watersheds are in good condition. The Big Snowies basins were formed by slumping at the head of larger drainages and are generally sensitive to soil disturbing activities. Other parts of the drainage are stable. Streams on the north drain into the Judith River and those on the south drain into the Musselshell River.

Downstream use on the south side is primarily for irrigation. Several streams remain year round and provide irrigation in all but the driest years. No significant fisheries or domestic use are involved. Therefore, the current and expected future uses are relatively insensitive to water quality.

With the exception of short periods of spring runoff, no streams on the north side of the study area provide irrigation water. Most of these streams supply underground aquifers for wells in the valleys.

Climate

The average annual precipitation in the study area varies from 20 inches at 5,000 feet to 55 inches at 8,600 feet. The majority of the high elevation precipitation is snow.

Water Storage

There are no known water storage projects planned in the study area and the potential for such projects is low or non-existent.

MINERALS**Geology**

The Big Snowy range is a broad arching structure of sedimentary rock running east and west. Layers of limestone, sandstone, and shale originated millions of years ago in a shallow inland sea. Folding and warping has resulted in an asymmetrical formation that is gently inclined on the north with a steep southern flank. Water and stream forming processes have eroded weaker underlying shales causing large landslides with the harder and more resistant limestone remaining. The resulting limestone cliffs now form the headwaters of most major streams in this range. These processes have given the Big Snowies their characteristic form -- a wide relatively flat crest with steep headwall and bowl shaped canyons draining into the adjacent plains.

Recent seismic, gravity, and magneto telluric information indicates a fault on the south side of the area, and the fault dips northward at a low angle. The seismic information indicated that sedimentary rocks present on the adjacent plains dip under the southern portion of the range.

Opportunities

The past and present mineral activity for base and precious metals has been minimal. Likewise, the potential for future activity also appears to be minimal. About 50,000 acres are under consideration for oil and gas leasing.

The southern half of the range has a potential for accumulation of oil and gas. This is because of the presence of the sedimentary rocks under that portion of the range. Seismic exploration is expected to continue, and there is the possibility of exploratory drilling.

Currently there is oil shale and mineral exploration in the Heath Shale at the foot of the range. Oil shale exploration in the Heath formation will be confined to the foothill fringe and will not directly affect the study area.

LANDS

Private Land

The study area includes 100 acres of private land on the periphery of the study area. The study area and adjacent National Forest System lands are bounded by private and BLM land.

Special Use

An electronic site on West Peak houses communications equipment for a variety of users. Because the topography of the study areas is much higher than the surrounding area, it provides several ideal electronic sites. The Forest has an application pending for a second electronic site. A buried waterline is under special-use permit in Halfmoon Canyon.

FACILITIES

Access

The study area contains 50 miles of low standard roads. Thirty-six miles can be negotiated with 2-wheel drive vehicles and 14 miles require 4-wheel drive vehicles. There are 80 miles of fair to poor trails in the study area. Public access through surrounding private lands is an issue, as there are only two public entry points on the south and one on the north of the Big Snowies.

Energy Corridors

There is no apparent need for other facilities such as power transmission lines. Valleys to the east and west are more suitable for this use.

PROTECTION

Fire

There is a high occurrence of natural fuels in this study area. During extreme fire conditions a start could result in a major fire. Access is limited and the potential for a major burn is great.

Insect & Disease

Currently there are no epidemic insect problems. Some epidemic mountain pine beetle infestation exists on adjacent lands particularly to the east in the Little Snowy Mountains.

About 1,400 acres has been classified as high risk to the mountain pine beetle and 3,900 acres as moderate risk. Other pests include Douglas fir beetle, spruce beetle, western balsam bark beetle, and spruce budworm. None of these are current threats and no major outbreaks are expected.

**SOCIAL AND ECONOMIC
ENVIRONMENT**

The Big Snowies Wilderness Study Area is in Fergus and Golden Valley counties. These counties are heavily dependent on farming and ranching, although Lewistown is a small service center for central Montana. Golden Valley County is projected to have a slight decrease in population over the next 20 years while Fergus County is projected to have a slight increase.

The Big Snowies is within a day's drive of the population centers of Great Falls, Lewistown, and Billings. It is within a reasonable distance of local wood processing plants, especially Judith Gap which is about 15 miles to the west. Local ranchers graze cattle in the area during the summer and fall months.

Recreational users of the study area generally come from the local area, especially Lewistown. During the hunting season the study area attracts users from a wider area, such as Great Falls and Billings.

SOCIAL TRAITS

A vital component of the social base line data is the social traits of a community that can be measured and are judged to be potentially affected by activities of the Forest. Three traits have been selected as important indicators of effect on local communities. These social traits are:

**Sense of Control/
Self Sufficiency**

-- The feeling that one has control over one's life direction; not subject to control by people outside the community.

Symbolic Meaning

-- The emotional and rational attachment one has on places and things on or from the Forest.

**Emotional/Spiritual
Renewal**

-- The revival or reestablishment of certain emotional and/or spiritual levels as related to wildlands; a state of mind characterized by calmness, quietness, and tranquility; escape from excessive stimuli.

FEIS
MONTANA WILDERNESS
STUDY ACT AREAS

CHAPTER IV
ENVIRONMENTAL CONSEQUENCES

Overview

This chapter describes the major environmental consequences of implementing the Preferred Alternative and other alternatives considered in detail. This chapter is the scientific and analytic basis for the comparison of the alternatives described in Chapter II. Environmental consequences are the result of activities scheduled to implement an alternative. The amount of activity varies by alternative and thus establishes the level of environmental effects. The alternatives include standards and guidelines designed to protect the long term productivity of the lands.

The effects discussed may be beneficial or adverse, direct or indirect, short term or long term, and reversible or irreversible. Direct environmental effects occur at the same time and place as the initial action, whereas indirect effects occur later in time or are removed in distance from the action, but are still reasonably foreseeable. Also, any conflicts with plans of other Federal and State agencies, and State and local governments are discussed.

This chapter summarizes the overall consequences of each alternative. Then the activities and associated consequences of the alternatives are discussed in more detail in terms of resource elements (e.g. range, wildlife, timber). Any mitigation measures are also discussed. Tables 4.1 and 4.2 display some of the outputs and physical, biological, social, and economic effects of the alternatives considered in detail. They are referenced throughout the chapter.

The first portion of this chapter deals with the Middle Fork Judith, the second portion with the Big Snowies.

Non-Significant Factors

NON-SIGNIFICANT FACTORS

The following factors of the environment would be affected the same under any alternative in this environmental impact statement for both the Middle Fork Judith and Big Snowies areas:

Cultural Resources

Cultural resources are protected equally under all alternatives.

Prime Farmlands

No prime farmlands are affected under any of the alternatives.

Wetlands

Wetlands are protected equally under all alternatives.

Minority, Economically Depressed, Elderly, Handicapped, Youth Groups, and Non-Traditional Groups

These groups received equal treatment and consideration under all alternatives.

Bald Eagle

White bald eagles are commonly observed on various portions of the study areas during fall and spring mitigations. No active bald eagle nests are known on the study areas. None of the alternatives significantly affect this species.

Peregrine Falcon

Peregrine falcons are rarely observed on or near the study areas during seasonal mitigations. No known active or historic nesting sites exist on the study areas. None of the alternatives will significantly affect this species.

Human Resource Programs

Human resource programs are the same under all alternatives and under current direction. Therefore, no human resource program has a significant effect on any of the environments.

Land Line Location

The Forest has an ongoing land line location program; however, the program does not have a significant effect on any of the environments.

Land Status

Land status activities do not have a significant effect on any of the environments.

SUMMARY OF EFFECTS

- Alternative 1** Alternative 1 would manage the Middle Fork Judith Wilderness Study Area to maintain the existing semi-primitive recreation opportunities and elk security habitat. Direct effects would be a loss of primitive recreation (wilderness) and timber management opportunities.
- Alternative 2** Alternative 2 would recommend the Middle Fork Judith Wilderness Study Area for wilderness classification. Direct effects would be a loss of semi-primitive motorized recreation and timber management opportunities.
- Alternative 3** Alternative 3 would manage the Middle Fork Judith Wilderness Study Area for a high level of commodity products. Employment and income increase the most under Alternative 3. Direct effects would be a loss of semi-primitive recreation opportunities and elk security habitat.
- Alternative 4** Alternative 4 would manage the Middle Fork Judith Wilderness Study Area for a moderate level of commodity products. Employment and income would increase significantly. This alternative would provide 8,320 acres of semi-primitive recreation opportunities. Direct effects would be the loss of some semi-primitive recreation opportunities and elk security habitat.
- Alternative 5** Alternative 5 would manage the Middle Fork Judith Wilderness Study Area for a low level of commodity products. Employment and income would increase slightly. Direct effects would be a loss of semi-primitive recreation opportunities and elk security habitat on 38,240 acres.
- Alternative 6** Alternative 6 would manage 24,160 acres for commodities and 67,840 acres for semi-primitive recreation. Employment and income would increase slightly. Direct effect would be the loss of semi-primitive recreation opportunities and elk security habitat on 24,160 acres.
- Alternative 7 - Preferred** Alternative 7 (Preferred) would manage 11,600 acres for commodities and 81,200 acres for semi-primitive recreation and wildlife habitat. Employment and income would increase slightly. Direct effects would be the loss of semi-primitive recreation

opportunities and elk security habitat on 11,600 acres.

Table 4.1 displays some of the outputs and physical, biological, social, and economic effects of the alternatives considered in detail.

TABLE 4.1 Resource Production and Effects by Alternative - Middle Fork Judith

RESOURCE USE AND DEVELOPMENT FACTORS CHANGE IN RECREATION SETTING BY 2030	UNITS	(Preferred)						
		ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 6	ALT 7
- Primitive (Wilderness)	Thousand Acres	0	+92	0	0	0	0	0
- Semi-Primitive	Thousand Acres	0	-92	-92	-84	-38	-24	-12
- Roaded Natural	Thousand Acres	0	0	+92	+84	+38	+24	+12

VISUAL QUALITY OBJECTIVES								
- Preservation	Thousand Acres	0	92	0	0	0	0	0
- Partial Retention	Thousand Acres	92	0	0	0	54	68	80
- Modification	Thousand Acres	0	0	92	84	38	24	12

WILDLIFE								
- Wildlife Habitat Improvement	Acre Equivalents							
-1982-1990		30	0	70	30	30	70	70
-2021-2030		30	0	100	30	30	70	70

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	(Preferred)						
		ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 6	ALT 7

WILDLIFE (continued)								
- Elk Population Potential ^{1/}								
-1982-1990	Number	1200	1200	1200	1200	1200	1200	1200
-2021-2030		1300	1160	1130	1150	1100	1180	1200
- Catchable Trout	Number							
-1982-1990		5250	5250	5250	5250	5250	5250	5250
-2021-2030		5250	5250	4500	4830	4410	4950	4950
- Total Land Harvested in Undeveloped Areas by 2030	Acres							
-Nonwinter range		0	0	31890	29690	6490	3090	3280
-Winter range		0	0	510	510	510	0	0
- Elk Hunter Recreation								
-1982-1990	Hunter Days	8000	8000	7100	7700	7800	8000	8000
-2021-2030		8000	8000	4500	4300	7200	7300	7700

RANGE								
1982-1990	AUMs	900	900	900	900	900	900	900
2021-2030		900	900	980	980	940	940	940

^{1/} Estimate of maximum number of elk that would use the area a portion of the year.

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	(Preferred)						
		ALT <u>1</u>	ALT <u>2</u>	ALT <u>3</u>	ALT <u>4</u>	ALT <u>5</u>	ALT <u>6</u>	ALT <u>7</u>
TIMBER								
- Allowable Sale Quantity	Million Board Ft. Per Year	0	0	10.6	3.9	3.5	0	0
-1982-1990		0	0	0	6.0	0	1.1	.7
-1991-2010		0	0	7.8	12.1	2.3	1.1	.7
-2011-2020		0	0	7.2	.5	0	.5	.7
-2021-2030		0	0	2.7	4.5	0.3	.5	.7
- Acres Harvested	Acres	0	0	1,270	440	400	0	0
-1982-1990				0	670	0	120	80
-1991-2000				870	1350	260	120	80
-2001-2010				800	60	0	60	80
-2011-2020		0	0	300	500	40	60	80
-2021-2030								
- Acres Available, Capable, Suitable	Thousand Acres	0	0	52.5	50.2	5.9	13.3	10.9
<hr/>								
LANDS								
- Lands Required for Right-of-Way	Miles	0	0	5.6	5.6	5.6	5.6	5.6
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RESOURCE USE AND DEVELOPMENT FACTORS		ALT	ALT	ALT	ALT	ALT	ALT	(Preferred) ALT
UNITS		1	2	3	4	5	6	7
FACILITIES								
- Disturbance from Rooding	Acres							
Arterial and Collector								
-1982-1990		0	0	6.3	4.2	4.2	0	0
-1991-2000		0	0	0	4.2	0	4.2	0
-2001-2010		0	0	1.4	1.4	2.1	2.1	0
-2011-2020		0	0	4.2	0	0	1.4	0
-2021-2030		0	0	0	0	1.4	0	0
Local								
-1982-1990		0	0	65	20	20	0	0
-1991-2000		0	0	0	28	0	5	5
-2001-2010		0	0	45	70	15	5	5
-2011-2020		0	0	40	5	0	5	5
-2021-2030		0	0	15	35	5	5	0
<hr/>								
SOCIAL/ECONOMIC								
- Change in Employment								
1982-1990	Person	0	0	140	50	45	0	0
2021-2030	Years	0	0	35	60	5	5	5
- Change in Income								
1982-1990	Thousand	0	0	1990	730	660	0	0
2021-2030	Dollars	0	0	510	840	60	90	140
- Change in Population	People							
1982-1990		0	0	322	115	103	0	0
2021-2030		0	0	80	138	12	12	15
- Change in Sense of Control/Self-Sufficiency	Index*							
-Less Development		+3	+3	-3	-3	-2	-1	-1
-Nonwilderness		-2	-3	+3	+3	+2	+2	+2
-Wilderness		-1	+3	-3	-3	-2	-1	-1
-Timber		-2	-3	+3	+2	+1	+1	+1
- Change in Symbolic Meaning	Index*							
-Economic Maximum		-3	-3	+3	+2	+2	+2	+1
-Nature/Refuge		+2	+3	-3	-3	-2	-1	-1

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	ALT	ALT	ALT	ALT	ALT	ALT	(Preferred) ALT
		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>

SOCIAL/ECONOMIC (Continued)

- Change in Emotional/ Spiritual Renewal	Index*							
- Human Activity		0	+3	-3	-2	-1	-1	-1

• Factors which reduce the expression of these social variables are shown with a (-) and factors which heighten the expression of these variables are shown with a (+). The numbers 1, 2, and 3 are a relative ranking; 1 is the least and 3 is the most. Factors which are neutral are represented by a (0). A discussion of these social variables is given on pg. 3-21.

DISPERSED RECREATION

The Dispersed Recreation Program essentially maintains an environment for outdoor recreation opportunities. Specific activities include posting signs, clean-up, visitor information services, and patrolling for public safety.

Table 4.1 summarizes the changes in recreation setting over 50 years. Dispersed recreation opportunities occur on primitive, semi-primitive, and roaded natural land areas.

Recreation

Alternative 1 maintains a semi-primitive recreation setting. Alternative 2, wilderness classification, would prohibit existing motorized recreation use. Motorized use occurs throughout the area. Alternative 3 would change the recreation setting on the entire 92,000 acres from a semi-primitive to a roaded natural setting. Alternative 4 is similar to 3, except 8,320 acres would remain in a semi-primitive recreation setting. Alternative 5 would change the recreation setting on 38,240 acres from a semi-primitive to a roaded natural setting. Alternative 6 would change the recreation setting on 24,160 acres from a semi-primitive to a roaded natural setting.

The Preferred Alternative (7) would change the recreation setting on 11,600 acres from a semi-primitive to a roaded natural setting. The remaining 81,400 acres would not be affected.

Wildlife

Semi-primitive recreation management provides more secure habitat for wildlife species which prefer areas with less roading and resource development.

Increases in motorized recreation will displace some wildlife, especially big game. Road and trail closures will help protect wildlife in critical areas (Lyon, 1982).

Alternative 2 has the least effect on wildlife because there would be no motorized access. Alternative 3 would have the most effect because 92,000 acres would change to a roaded natural

Timber

Maintaining primitive (wilderness) or semi-primitive recreation opportunities decreases the volume of timber available for harvest.

No timber harvest would occur under Alternatives 1 and 2. Alternative 3 would offer the largest amount of timber for harvest, and Alternatives 4, 5, 6, and 7 (Preferred), in that order, would offer less timber harvest.

Soil and Water

Undeveloped campsites and other heavily used areas may adversely affect soil and water in localized areas, causing erosion, soil compaction, and water quality degradation (Cole and Schreiner, 1981). Dispersed recreation can also result in fecal pollution of water (Pacha, 1981). Off-road vehicles adversely impact soil and water in heavy use areas. These effects occur throughout the Forest where the terrain and vegetation permit this type of use.

Protection

Because recreation use levels are expected to increase over time, the number of person-caused fires would also increase. This adverse effect would be the same for all alternatives.

VISUAL RESOURCE

The Visual Resource Program determines the degree to which the natural landscape may be modified in its appearance by various activities, such as timber harvest and mining. Categories or objectives are preservation, retention, partial retention, and modification of the natural landscape. Objectives are determined in part by how visible areas are from population centers, major highways, roads, trails, campgrounds, and other recreation developments.

Table 4.1 shows the number of acres within each visual quality objective.

The study area's remoteness, rolling topography, and varied landscape combine to lessen the effects of resource activities on the visual resource. The lower, limestone canyons are more sensitive to visual impacts.

Visual Quality

The natural landscape would be preserved under Alternative 2, although Alternative 1 retains the landscape much as it is. The landscape would be modified under Alternatives 3, 4, 5, 6, and 7 (Preferred). Short term impacts from timber harvest and roads could be mitigated by scheduling treatments which would be spaced and timed so that adverse visual impacts are minimized. (USDA-Forest Service, National Forest Landscape Management 2:50 (Timber), 1980). Alternative 3 would impact the visual resources of the lower Middle Fork Canyon.

Social and Economic

Alternatives 3 and 4 harvest more timber in visual sensitive zones. Thus, the costs to harvest the timber are greater due to special road standards and added care required in logging.

WILDERNESS

The Wilderness Program provides for protection and preservation of large areas in their natural state. Primitive recreation takes place within classified wilderness and this opportunity can be maintained with no additional impacts on the environment.

Table 4.1 shows the acres in wilderness for each alternative. Alternative 2 is the only alternative with recommended wilderness and thus, the only alternative affected by the Wilderness Management Program.

Recreation

Recommended wilderness under Alternative 2 would shift the semi-primitive recreation opportunity to primitive recreation. Under wilderness classification, the area would be closed to motorized recreation. There would be a loss of 10,000 RVDs of motorized recreation per year.

Timber

Timber harvest opportunities would be foregone under Alternative 1 and Alternative 2 (wilderness), however, the overall Forest timber harvest level does not decrease. In order to harvest this same level of timber land outside the MWSA areas must be more intensively managed.

Soils & Water

Alternative 2, wilderness classification, would protect the watershed of the Middle Fork Judith and the adjacent soils from resource activities. The study area does not fill a target for ecosystem or wilderness associated wildlife species representation.

Diversity

Vegetative diversity may decrease. Natural diversity is high in the study area with both climax timber and grassland species present. Management fire in wilderness would be used as a natural method of vegetation management and maintaining diversity.

Minerals

There is a potential for silver, copper, lead, zinc, and sapphires in portions of the Middle Fork Judith MWSA area (Hamilton and Mayerle, 1982).

Under Alternative 2 (wilderness) the area would be withdrawn from all forms of mineral entry subject to valid existing rights (Wilderness Act of 1964). Development and production would be allowed on claims with valid discoveries made prior to the withdrawal date; however, it would be very restricted and costs would increase.

Protection

Under wilderness classification (Alternative 2) the risk of mountain pine beetle and western spruce budworm infestations reaching epidemic levels would increase significantly, (Wellner, 1978). Currently much of the timber resource is mature or overmature lodgepole pine which would be susceptible to the insects. The potential for Douglas fir beetle and spruce beetle infestations would increase over the planning period since timber harvest, to remove susceptible stands, would not be possible.

Air Quality

Management fire in wilderness (Alternative 2) will be within the standards of the State of Montana Cooperative Smoke Management Plan.

Social and Economic

Access for mineral activities would be subject to restrictions under wilderness and could increase the costs to miners. Mineral potential is high in the Middle Fork Judith.

Timber harvesting opportunities, averaging 3.8 million board feet per year, would be foregone in the study area under Alternative 2. In order to maintain the Forest's harvest level, areas outside of wilderness would need to be more intensively managed.

An increase of visitors to the study area due to the wilderness classification could help the local economy, outfitters, and other recreation-related businesses, (Hendee, Stankey and Lucus, 1978).

The social variable of sense of control and self sufficiency would be affected by the wilderness designation of the study areas. Those people who do not want wilderness designations would feel a loss of control by Alternative 2 and increased control in the other alternatives. The same alternatives would create the opposite feelings for those people wanting wilderness designation.

Social benefits in wilderness classification under Alternative 2 would exist, especially for people who enjoy nonmotorized use. People recognize intrinsic benefits to having a pristine environment nearby, such as being able to "get away from it all," having plants and animals in their natural state and knowing that an undeveloped area is nearby. Wilderness classification would help improve the distribution of wilderness in Montana.

Wilderness designation would result in the area being managed to leave it unimpaired for future generations use and enjoyment. It would provide valuable opportunities for research and study of natural life processes which are largely undisturbed by man.

Other Alternatives

Alternative 1, 3, 4, 5, 6, and 7 (Preferred) forego the opportunity for wilderness classification at this time. Alternative 1 would retain the opportunity for future wilderness classification on all 92,000 acres. Alternative 4 would retain the opportunity for future wilderness classification on 8,320 acres, Alternative 5 on 53,760 acres, Alternative 6 on 67,840 acres, and Alternative 7 (Preferred) on 80,400 acres.

WILDLIFE AND FISH

Wildlife and fish management is the maintenance and improvement of wildlife and fish habitat. Activities include vegetation management for increasing the amount of shrubs, forbs, and grass available to various species, as well as protecting some sites as they exist for species depending upon an "old growth" environment. Maintaining security cover for some animals and minimizing the disturbances of human activity in calving areas, migration routes, and T&E species habitat are also objectives. Activities in fisheries management include minimizing sediment in streams, fish structure maintenance, and channel stabilization.

Table 4.1 lists acres of wildlife habitat improvement. Elk and catchable trout populations are reported to reflect habitat capacity.

All alternatives, except Alternative 2 (wilderness), have wildlife and fish habitat programs. However, the management activities for Alternative 3 and 4 are primarily done to mitigate some of the adverse effects from other resource activities, such as roading and timber harvesting.

Alternative 1 has the most beneficial effect on the elk populations whereas other alternatives reduce populations by 20 to 100 animals. The Judith elk herd has state significance and is a large contributor to the quality elk hunting opportunity in the Little Belt Mountains. Increase in livestock grazing on elk winter range contributes to the adverse effect on the population.

Alternatives 1 and 2 would maintain catchable trout populations. All other alternatives would reduce the population by 300 to 840 fish. This decrease would be due to increases in grazing in riparian zones.

Recreation

Alternative 1 would increase recreation opportunities for viewing and hunting because of the increased big game populations. Alternative 2 would maintain these opportunities. Alternatives 3 and 5, even though they have intensive wildlife habitat programs, show a decrease in elk hunter recreation. Most efforts in wildlife management in these alternatives are directed toward mitigation of timber and grazing activities. Table 4.1 shows elk hunter recreation by alternative.

Timber

In areas where big game habitat is emphasized, attaining optimum cover/forage relationships and high levels of forage production require that the scheduling and distribution of timber harvest meet specified wildlife management objectives (Thomas, 1979; Lyon, 1975-1979). Alternatives 3, 4, 5, 6 and 7 (Preferred) harvest timber on important big game habitat.

Facilities

Road closures provide big game security from human disturbance (Flynn, 1982). Closures would provide security for animals in calving areas, along migration corridors, and on important summer ranges.

Protection

Prescribed burning to revert back to an earlier successional stage would have a long-term benefit for the wildlife resource, by maintaining a high level of forage production (Fisher and Clayton, 1982). All alternatives, except 2 (wilderness), use prescribed burning for wildlife habitat improvement. Burning would meet the State Air Quality Standards.

Social and Economic

The wildlife and fish management program has both beneficial and adverse effects upon the economy of the state and surrounding communities. Favorable economic effects of intensive wildlife management would be an increase in recreation opportunity, visitors to the area, and thus, an indirect effect of increasing income to the local economies.

Wildlife habitat programs can have an adverse economic impact on timber harvesting, ranching, and mineral activities. The cost of doing business can increase as specific measures and structures are needed to mitigate adverse effects on big game populations, and other wildlife and fish populations.

Under Alternatives 3, 4, 5, 6, and 7 (Preferred) range and big game values would often be in conflict. Most winter range on the Forest is also primary grazing land for livestock. If livestock grazing would increase on winter ranges, special fencing and/or intensive grazing management systems would be needed to maintain wildlife forage at a high level. Again, the effect of an intensive wildlife habitat program would be to increase the cost of grazing to ranchers. Elk that summer in the Middle Fork Judith are highly

dependent on private, state, and other Federal land for winter habitat. The Judith River State Game Range provides much of this winter habitat. Degradation of hay stacks on adjacent private land may occur if the big game population is too high and/or a severe winter occurs, requiring big game to move off the Forest or game range in search of food.

The social effects of an intensive wildlife habitat program are favorable. People usually agree that an active wildlife program is a "good thing" unless the management directly impacts their livelihood. Alternative 1 provides for the highest level of quality wildlife habitat. Under this alternative, enjoyment of wildlife would be at the highest level whether through hunting, fishing, photography, or observation. The social benefits from wildlife can be expected to be less with Alternatives 3, 4, 5, 6, and 7 (Preferred) because wildlife habitat and population generally remain at the same level or decrease.

RANGE

The Range Management Program provides for efficient livestock grazing on forest and rangelands commensurate with other needs. Activities include management of range permits, monitoring range use, and maintaining and constructing range improvements, such as fences and water developments.

Table 4.1 shows the acres grazed by livestock for each alternative.

Soils & Water

All alternatives, except for Alternative 1 and Alternative 2, increase grazing over a 50-year period. Increase in sedimentation and a decrease in water quality could occur. Mitigation measures are listed in the management practices, standards, and guidelines for grazing in riparian zones. (See Lewis & Clark National Forest Plan.) Proper distribution of livestock would be achieved through the placement of salt and construction of fences.

Range Improvement

Prescribed burning to revert the vegetation to an earlier successional stage would have a long-term benefit for the range resource, by maintaining a high level of forage production (Fisher and Clayton, 1982). Alternatives 3, 5, 6, and 7 (Preferred), burn the most acres by prescription for range management.

Construction of fences and water developments improve the distribution of livestock, provide additional grazing use, and improve the vigor and production of forage.

Recreation

Some grazing impacts include conflicts with recreationists, especially in heavily used recreation areas (Paulsen, 1975). Alternatives 3 and 4 would create the most conflict. Fences, gates, and cattleguards can minimize conflicts with recreational use.

Wildlife & Fish

Livestock grazing has an adverse effect on big game -- primarily where grazing occurs on big game winter ranges.

Elk population decreases under Alternatives 3, 4, 5, 6, and 7 (Preferred) which provides for a small increase in livestock AUMs. The increases in AUMs would occur on both winter and summer big game range. Competition between livestock and elk could have an adverse effect on elk on summer ranges (Thomas and Toweill, 1982). The opportu-

nity to effectively mitigate adverse impacts upon big game becomes less as livestock allocations increase.

Alternative 1 and Alternative 2 maintain the catchable trout population, but other alternatives result in a 300 to 840 trout decrease over 50 years due to increased grazing in riparian zones.

Timber

All alternatives, except 1 and 2, include livestock grazing of transitory range. Assuming forage use is not excessive, livestock grazing would not adversely affect timber production (McLeana and Clark, 1980; Hann, 1981).

Social and Economic

All alternatives except, Alternatives 1 and 2, increase livestock grazing to provide more beef, lamb, and wool to the consumer. This would generate relatively small income increases to the local industry and increase grazing receipts to the U.S. Treasury. Alternative 3 increases grazing by 9 percent over the current level.

An increase in grazing opportunity for all alternatives, except Alternatives 1 and 2, benefits the ranching operations by assuring a constant supply of grazing land.

Some impacts of grazing include conflicts with recreationists, especially in favorite fishing or camping spots. Mitigation measures would exclude livestock from areas during heavy recreation use.

TIMBER

The Timber Management Program ensures the growth and use of the timber resource for the benefit of the Nation. Activities include the scheduling of timber harvest, administration of timber sales, timber stand improvements such as thinning, and the reforestation of harvest sites through site preparation and planting. Road construction and maintenance, an activity closely associated with timber harvest, is discussed later in the chapter under Facilities. Table 4.1 gives the harvest volumes, the acres harvested, and acres available, capable, and suitable for timber management.

The Preferred Alternative (7) would harvest about 28 million board feet of timber in the upper Middle Fork over the 50-year planning period. In terms of the overall Timber Management Program for the Forest, this volume is not significant. However, the Preferred Alternative does program timber harvest on those areas where the investment in roads is commensurate with the value to be removed.

The Preferred Alternative (7) does not program any regulated timber harvest in the Lost Fork, or the lower Middle Fork of the Judith. An additional 255 million board feet would be available during the 50-year planning period if this area was fully developed (Alternative 3). This would take a high investment in roads to access these areas. The failure to harvest timber periodically is an irretrievable loss of products. Alternative 4 would harvest 270 million board feet, Alternative 5 about 60 million board feet and Alternative 6 about 32 million board feet.

Alternative 1 does not program any regulated timber harvest in the study area. Wilderness classification (Alternative 2) would prohibit harvesting timber, except for wilderness or mineral purposes.

Soils & Water

Water yield from Alternatives 3 and 4 is less than a 2 percent increase per decade. This change is less than the annual variation in water yield due to natural factors. These alternatives would also have the highest levels of sedimentation. Mitigation measures to prevent soil erosion from timber harvest would include directional felling of trees, waterbarring on skid trails, and seeding landings.

Recreation

Alternatives 3, 4, and 5 would develop the most land for motorized use. Alternatives 6 and 7 (Preferred) would maintain a large area in a semi-primitive setting.

Favorable social effects of increased roading include increased opportunity for recreationists who enjoy motorized use, although this would depend on the road management for the area. Timber harvest would adversely affect those people who enjoy an unroaded recreation setting and a natural landscape.

Air Quality

Under Alternatives 3, 4, 5, 6, and 7 (Preferred) prescribed fire would be used for stocking control and disposal of activity fuels. Under all alternatives, burning would meet the State Air Quality Standards, in compliance with the Clean Air Act of Montana.

Visual Quality

Timber management activities have significant effects on visual quality. Although the impacts of timber management are generally short term, the immediate change to the existing landscape is undesirable to many Forest visitors. The establishment of visual quality objectives provides the method for carrying out timber management and other activities, while protecting the visual resource. Treatments would be spaced and timed so that adverse visual impacts are minimized. Alternatives 3 and 4 would have the greatest potential for disruption of the visual resource.

Wildlife & Fish

Timber harvest provides wildlife forage and habitat diversity by creating different age classes of trees. Timber harvesting reduces hiding and thermal cover, which primarily impacts big game fall ranges. The Preferred Alternative (7) would effect big game security habitat on 11,600 acres in the Middle Fork Judith Study Area. Alternatives 3, 4, 5, and 6 would affect security habitat on more acres.

Wildlife species associated with old growth could be adversely affected under Alternatives 3, 4, 5, 6, and 7. Less acres would be maintained as old growth, which would decrease habitat available for these species. Habitat for wildlife species using the grass/forb stage would increase under these alternatives. Human use, equipment operation, and other noises associated with timber harvesting activities could have a short term effect on the distribution of wildlife.

Fish populations could be adversely affected by increased sedimentation levels in the streams from timber harvesting. Mitigation measures are listed in the management practices, standards, and guidelines for timber harvest. (See Lewis and Clark National Forest Plan.)

Range

Timber management is the greatest contributor to habitat modification. Additional forage for wildlife and livestock can be created through timber harvesting (Basile and Jensen, 1971). Alternatives 3, 4, 5, 6, and 7 (Preferred) would increase transitory range for livestock.

Protection

Timber harvesting would be used to control insects and disease, particularly in Alternatives 3 and 4. Under these alternatives, the Forest would be less susceptible to mountain pine beetle attacks since more acres are in a variety of age classes which are created through timber management activities. Alternatives 1 and 2 provide for the least protection from mountain pine beetle infestation.

Fuels accumulation results from timber harvest increases the risk of forest fires. This effect would be mitigated under all alternatives by piling and burning slash.

Social and Economic

Increases in the level of timber harvest would help meet the demand for wood products and help stabilize timber dependent communities. The Preferred Alternative (7) would provide a modest increase in the Forest's Timber Sale Program. Alternatives 3, 4, 5, 6, and 7 (Preferred) would increase employment, personal income, and county and federal receipts.

The economic benefits generated under Alternatives 3, 4, 5, 6, and 7 (Preferred) would help to increase the sense of control, self sufficiency, and cohesion within timber dependent communities, such as White Sulphur Springs, by producing a more optimistic economic outlook. Alternatives that increase harvesting would help relieve the uncertainty for the timber industry.

The communities of Monarch and Neihart are occupied or used by loggers, miners, recreationists, summer home residents, retired residents, and businessmen. Because of diverse values and expectations, differences of opinion on issues affecting the Forest would occur.

**MINERALS
OIL AND GAS**

The Minerals Program administers mineral exploration and development on National Forest System lands compatible with other resource values. Oil and gas exploration and development is carried out by private companies under a leasing program. The BLM (Bureau of Land Management) is responsible for oil and gas leasing. The Forest Service reviews lease applications and recommends to the BLM what National Forest lands should be leased and what controls (stipulations) are needed to protect surface values and uses.

Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling for any given lease block (a collection of leases held by one company). The Middle Fork Judith Study Area is considered low in gas and oil potential. However, one company has made application for leasing acres within the study area.

Alternatives 3 and 4 would maximize the opportunity for exploration and development of potential gas and oil reserves. These alternatives would also have the greatest effect on the environment as described in this section. Alternatives 1, 5, 6, and 7 (Preferred) would provide less opportunity for oil and gas exploration and development because semi-primitive recreation area would be protected by recommending leases with stipulations for limited surface use and timing restrictions.

Alternative 2 (wilderness) would be the most restrictive. If the area becomes wilderness, in accordance with the Wilderness Act, on January 1, 1984, the area would be withdrawn from all forms of mineral entry, subject to valid existing rights. Presently applications for oil and gas leases can be filed within the area. However, the Forest Service has no authority to process or issue leases. Opportunity for oil and gas exploration would be foregone under Alternative 2 (wilderness). Mining claims can be filed until January 1, 1984. After that the area is withdrawn from further mineral entry. All claims filed previous to the date are subject to existing rights.

Soils & Water

Soil productivity may be adversely affected by off-road vehicle travel. This can be avoided by limiting off-road travel to dry periods during the summer and fall and by avoiding compaction-prone soils.

Seismic exploration is done in such a way as to have minor effects on soil and water.

Construction of roads, drill pads, and other facilities would result in soil disturbance and would require measures to prevent erosion and increased sediment in streams.

Air Quality

The effects on air quality are generally short term and minor. Dust from trucks and other equipment are a minor impact. A cloud of smoke and dust from each blast when explosives are used on the surface would quickly dissipate.

Vegetation

The method, type, and amount of explosive used would vary the amount of vegetative disturbance. Vegetation that is damaged by surface explosives would grow back in a relatively short time, depending on the time of year, amount of moisture, and type of vegetation. There would be little change in species composition. Drilling would disturb the vegetation and require some reclamation.

Construction of drill pads and roads would result in destruction of existing vegetation. The relatively small area disturbed by oil and gas activities should have little effect on native plant communities. Disturbed areas would be seeded with grass and native shrubs would be planted. Reforestation of reclaimed roads and drill pads would take place naturally.

Recreation

Oil and gas activities would affect the quality of the recreation setting. The effect would be particularly noticeable in semi-primitive settings where the introduction of roads and motorized use would be distracting. Some business operations, such as outfitters and guides, could be adversely affected by the disruption of the semi-primitive recreation setting by oil and gas activity. Traditionally used campsites would be protected by non-occupancy stipulations (Environmental Assessment on Oil and Gas Leasing on Nonwilderness Lands, 1980).

Noise from helicopters transporting personnel and moving equipment would take place during any portable seismic activity. Also, when surface charges are detonated, the noise from the blast may be audible for several miles, depending on the terrain and location of the operation (Environ-

mental Assessment on Geophysical Exploration, 1982).

User conflict on roads may take place between the general public, log hauling traffic, and oil and gas exploration traffic.

Visual Quality

Standards for pad site and road reclamation are designed to return the setting to a natural condition. However, visual quality may be slightly lowered due to contrasting color and shape.

Wildlife

The timing and location of preliminary exploration and exploratory drilling activities in relation to key habitat use patterns would determine the significance of disturbances or displacement. The greatest potential conflict would be during use periods on restricted key habitat, such as big game concentration areas and migration routes. Direct mortality from seismic activity is very unlikely. Wildlife habitat loss or degradation would be negligible during preliminary exploration (Environmental Assessment on Geophysical Exploration, 1982).

The sensitivity periods for big game are as follows:

Elk winter range	12/1 to 4/30
Elk calving areas	5/1 to 6/30
Elk migration routes	Designated by District Ranger
Mule deer winter range	12/1 to 4/30

Effects on wildlife would include possible destruction of habitat by road, drill pad, and other facility construction. The destruction of habitat could be significant if the habitat is important and limited.

Range

Human activity, blasting, and helicopter use may affect livestock habitat use patterns for short periods of time. Critical areas can be protected by non-surface occupancy stipulations.

Social and Economic

The preliminary exploration is usually done by persons from outside the local area. Demand for services in the Monarch, Neihart, and Stanford communities would increase slightly during exploration.

Leasing National Forest lands for oil and gas exploration increases revenue to the Federal Treasury. Half of the revenue is returned to the State of Montana.

A discovery of oil and gas that would lead to production would have significant social and economic effects. Local community populations, employment, income, and community cohesion would change. Individuals' lifestyles, job dependence, sense of control, self sufficiency, and feelings of certainty and uncertainty would be affected.

METALLICS

The Minerals Program administers the mineral exploration and development on National Forest System lands compatible with other resource values. Exploration and development of metallic or hard-rock minerals are carried out by private companies. Mineral prospecting and extraction normally occur on National Forest lands.

Metallic mineral exploration and development will occur under all alternatives. Alternatives 1 and 2 would be more restrictive on metallic mineral activities.

Soils & Water

The mineral potential is low for placer and dredging operations. A large operation would use about two or three acres and would affect soil and water in the local area. Soil disturbance would require special measures to prevent increased sedimentation in the local streams. Underground mining would create mine tailing disposal sites of 1 to 13 acres. Mitigating disposal sites would include site location away from water and landscaping the area around the site. Access roads and trails would be constructed under the Forest Management Practices, Standards, and Guidelines (see Lewis and Clark National Forest Plan).

Wildlife and Fish

Small mammal and fish habitat could be eliminated in localized areas of placer and dredging operations. Revegetation measures would help mitigate adverse impacts in some situations (Wildlife Users Guide for Mining and Reclamation, 1982):

Human activity and noise of mining operations would displace big game in the immediate area. Hauling of ore from underground mines would increase traffic and could increase big game road mortality along migration routes.

Visual Quality

Mining operations within the proximity of arterial and collector roads could adversely affect visual quality. Any open slope or open pit mining would adversely affect visual quality.

Social and Economic

Alternatives 3, 4, and 5 would enhance the lifestyle and job opportunity of those economically dependent on mining while Alternative 2 would limit this lifestyle and opportunity.

SOIL AND WATER

Soil and Water Management Program protects, conserves, and enhances the soil and water resources. Activities include (1) monitoring water quality, quantity, and the effects of activities on soil and (2) protecting the resources, where needed, with structural improvements and other mitigating actions.

Social and Economic

Soil and water management would require additional structural improvements where there is increased grazing in riparian zones. These improvements must be done in order to maintain soil and water quality. The effect of this would be a slight increase in cost to grazing operations. All alternatives, except Alternatives 1 and 2, increase grazing in riparian zones.

Timber

An adverse economic impact of maintaining water quality and soil production would be realized by timber harvesting operations because of the expense of harvesting in riparian zones. Alternative 3 is the only alternative which allows timber harvest in riparian areas on a regulated basis. Guidelines such as selection cutting, cabling, and handpiling of slash must be followed when harvesting in these areas, to prevent sedimentation and decreases in water quality. (See Lewis and Clark National Forest Plan.)

LANDS

The Lands Program deals with special use management, land adjustment planning, land exchange and acquisition, and rights-of-way acquisition.

The Preferred Alternative (7) would not have any significant effect on private lands. Under wilderness classification (Alternative 2) there would be a need to acquire the private in-holdings in the Middle Fork of the Judith or protect these values by scenic easement. This would be regarded by some people, especially the landowners, as more unneeded control.

**FACILITIES - ROADS
AND TRAILS**

The Facilities Program provides and maintains capital improvements such as roads and trails. Transportation planning; road engineering and design; and construction and maintenance of local, collector, and arterial roads and trails are all activities included in facilities management.

Table 4.1 shows the acres disturbed from roading by alternative. Alternatives 3, 4, 5, 6, and 7 (Preferred) would provide roads in the Middle Fork Judith Study Area to support timber harvest activities. The rolling slopes and headwater basins can be accessed from Kings Hill (west of the study area). Complete access would require additional road construction in the lower canyon area.

Soils & Water

Roading may have an adverse long term, irretrievable effect on the physical environment. (Megahan 1972-75; Megahan and Kidd, 1972). Road construction causes the disturbance and removal of the soil which can result in soil erosion, increased stream sedimentation, and diminished water quality. This effect varies by the amount of road constructed and by the type of soils. Trail construction has similar effects, but to a much lesser degree. Mitigation measures have been designed to minimize these effects which are outlined in management practices, standards, and guidelines for each management area. Alternatives 3 and 4 show more acres disturbed by roading than Alternatives 5, 6, or 7 (Preferred).

Fish & Wildlife

Road management is a critical element to wildlife, particularly for big game species. Road construction removes vegetation or wildlife forage; however, the critical effect is the increased access people have to the Forest. Human activity and encounters with wildlife can disturb elk calving areas, migration routes, forage areas, and security cover. Potential effects include displacing animals from their historically used ranges, poaching, and less protection from hunters. Trails management presents some of the same effects, but again to a much lesser degree. Alternatives 3 and 4 have the most roads. Alternatives 3, 4, 5, 6, and 7 (Preferred) recommend the closure of new roads in critical wildlife habitat. Alternatives 1 and 2 would have no disturbance from new roads.

Recreation

Table 4.1 shows the acres maintained by the different recreation settings. Alternatives with the highest timber levels would cause the greatest change in recreation settings. Road construction would affect recreationists by changing the recreation setting from a semi-primitive to a roaded natural setting. This would be considered a long term effect, even though it could be reversed through road closures and restoration of roadbeds. Roding in turn would affect the types of recreation activities and user groups. Roads and trails would increase the motorized recreation opportunity for snowmobiling and trail biking.

Visual Quality

Road construction would create visual impacts by removing vegetation and disturbing the soil, thus changing the color, texture, and lines of the landscape (USDA-Forest Service, National Forest Landscape Management, Roads 2(4), 1977). In open areas, roads introduce strong lines into the landscape that can be visible for many miles, depending on topography and vegetation. These impacts would not be as great for alternatives which harvest less timber. Trail construction would have little effect on the visual quality. Visual management objectives provide for mitigating measures to reduce the effects of roding.

Protection

Because roding provides greater access to the Forest, more timber stands which are susceptible to insects and disease may be harvested. Alternatives 3 and 4 provide the greatest opportunity to harvest stands, whereas Alternatives 5, 6, and 7 (Preferred) have the least. Increased roding would increase human activity which in turn increases the risk for person-caused wildfire.

Social and Economic

Roding can have indirect economic benefits to timber, ranching, and mining operations, because it provides access to timber, rangeland, and minerals. Ease of access reduces the cost to the operation while increasing the available supply of the commodity.

Roding can have an adverse effect upon the symbolic meaning people may attach to the roadless, natural setting of a particular area. On the other hand, roding can provide greater opportunities for people to enjoy the area or derive economic benefit. Road management, such as road closure and careful placement of roads, can mitigate adverse effects.

PROTECTION - FIRE

The Fire Management Program includes the prevention and suppression of wildfires, the use of fire to dispose of activity-created fuels, and fire to improve resource values.

All alternatives provide for an increase in prescribed burning. Those alternatives that provide for the larger amount of prescribed fire have the greatest potential for reducing acreage burned by wildfire. Wildfire burned acreage should also be reduced in decadent lodgepole pine by scheduling timber harvests in high hazard fuels with subsequent debris disposal. Alternative 3 provides for the largest amount of harvest followed by debris disposal. Alternative 2 (wilderness) would provide the most opportunity for certain unplanned ignitions to more nearly play their natural role when meeting pre-established criteria.

Table 4.1 shows the average annual planned prescribed burning for each alternative.

The Level I Fire Management Analysis Report describes in detail the environmental consequences of prescribed fire and wildfire on the ecosystem of the Lewis and Clark National Forest. Other documents that describe environmental consequences in more detail are:

Fire Ecology of Eastern Montana Forest Habitat Types, Editorial Draft, January 1982, Intermountain Forest and Range Experiment Station, USDA, Forest Service, Fischer and Clayton.

Environmental Assessment - Fire Management and Protection Program for the Scapegoat Wilderness and Danaher Portion of the Bob Marshall Wilderness, January 1981, USDA, Forest Service.

Final Environmental Statement - Fire Management in the Selway-Bitterroot Wilderness - A Proposed Policy change, December 1976, USDA, Forest Service.

Final Environmental Statement - Northern Region's Slash Disposal Program, November, 1974, USDA, Forest Service.

The use of prescribed fire for resource improvement and debris disposal is also discussed under each resource element where it occurs.

According to these documents, prescribed fire for the improvement of resources and for the reduction of the wildfire hazard has excellent potential on the Lewis and Clark National Forest with only minor adverse impacts. These impacts can all be mitigated using Standard Operating Procedures described in the Fuel Management Planning and Treatment Guides, July 1981, Northern Region, USDA, Forest Service.

**PROTECTION - INSECT
AND DISEASE**

The effects of insects and disease are discussed throughout the chapter.

**SOCIAL AND ECONOMIC
FACTORS**

The social and economic characteristics of the people surrounding the Lewis and Clark Forest are unique compared to many of the other National Forests. The economic structure is highly dependent upon natural resources such as farming, ranching, logging, lumber processing, and some mining. This dependency is especially true for the rural communities next to the Forest, and to a lesser extent for Great Falls (although it too services the agricultural sectors for central Montana). These natural resource sectors provide primary jobs; most of the remaining jobs (retail, services, and construction) are directly dependent upon them. Compared to the rest of the nation and to Montana, there is little manufacturing.

Much of the area's future growth remains tied to the natural resources. The area has made repeated attempts to lure new business in, but with only limited success. Although it offers many opportunities, its weather and geographic isolation will continue to make businesses look elsewhere. Tightening credit, escalating energy and fertilizer prices, and higher transportation costs continue to make the economic situation bleak. Any alternative which decreases job opportunities would be especially bad because of these economic conditions; likewise, any increase in job opportunities would have beneficial effects.

The Middle Fork Judith is slightly different from most areas in Montana because the ratio, on a county wide basis, of private land to public lands in the local area is much higher than other areas of the state containing National Forest land. Because of the role played by private, state, and other federal lands in the local area's economy, the effects of National Forest management, although important, are relatively small and are confined to three resource areas: timber, range, and recreation.

Discovery of a sizeable quantity of marketable hard rock minerals would have a significant additional impact in the population, employment, and income of the local communities.

Table 4.1 shows the changes in employment, income, and population by alternative. Also shown is the change in social traits which is discussed throughout this chapter.

Social and Economic Consequences
Middle Fork Judith

Population

Alternatives 3, 4, 5, 6, and 7 (Preferred) would result in a population increase. Alternatives 3 and 4 would have population increases which may effect small communities such as White Sulphur Springs, where processing of wood products from these alternatives would take place.

Increased population in the White Sulphur Springs area would most likely increase pressures for land subdivisions. Most rural communities within the area-of-influence want community growth, therefore, the costs of new ownership patterns would be more acceptable.

Employment

Alternatives 3, 4, 5, 6, and 7 (Preferred) provide an increase in job opportunity. This increase would take place in the wood products industry.

Alternatives 1 and 2 would not significantly effect job opportunity.

Job opportunities in the ranching sector are limited because farms and ranches can support only a given number of people and maturing youth will continue to look outside of the area for jobs. This has led to an older population structure in the past and will continue to do so in the future. These age differences will continue to have effects on recreation preferences. The small increase in grazing under Alternatives 3 and 4 (80 AUMs) and Alternatives 5, 6 and 7 (40 AUMs) would have little affect on employment in the ranching sector.

Recreation use under Alternative 1, 3, 4, 5, 6, and 7 (Preferred) would probably not significantly change employment opportunities. Wilderness classification (Alternative 2) could attract additional users but would not cause any major economic effect. The potential for additional outfitter and guide operation could generate some new business in the local area.

Income

Like population and job opportunity, income effects are largely related to the output of the timber resource. Alternative 3, 4, 5, 6, and 7 (Preferred) would increase the income to the area. These alternatives would provide a beneficial effect to local area income.

SUMMARY OF EFFECTS**Alternative 1
Preferred**

Alternative 1 would manage the Big Snowies Wilderness Study Area to maintain the existing semi-primitive recreation opportunities and retain all multiple use options. Direct effects would be a loss of primitive recreation and timber management opportunities.

Alternative 2

Alternative 2 would recommend the Big Snowies Wilderness Study Area for wilderness classification. Direct effects would be a loss of semi-primitive motorized recreation and timber management opportunities.

Alternative 3

Alternative 3 would manage the Big Snowies Wilderness Study Area for a high level of commodity products. Employment and income increase the most under Alternative 3. Direct effects would be a loss of semi-primitive recreation opportunities and wildlife security habitat.

Alternative 4

Alternative 4 would manage the Big Snowies Wilderness Study Area for a moderate level of commodity products. Employment and income would increase. This alternative would provide 16,000 acres of semi-primitive recreation opportunities. Direct effects would be the loss of some semi-primitive recreation opportunities and wildlife security habitat.

Alternative 5

Alternative 5 would manage the Big Snowies Wilderness Study Area for a low level of commodity products. Employment and income would increase. This alternative would provide 39,100 acres of semi-primitive recreation opportunities. Direct effects would be a loss of some semi-primitive recreation opportunities.

Table 4.2 displays some of the outputs and physical, biological, social, and economic effects of the alternatives considered in detail.

TABLE 4.2 Resource Production and Effects by Alternative - Big Snowies

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	(Preferred)				
		ALT <u>1</u>	ALT <u>2</u>	ALT <u>3</u>	ALT <u>4</u>	ALT <u>5</u>
CHANGE IN RECREATION SETTING BY 2030						
- Primitive (Wilderness)	Thousand Acres	0	+98	0	0	0
- Semi-Primitive	Thousand Acres	0	-98	-98	-82	-59
- Roaded Natural	Thousand Acres	0	0	+98	+82	+59

VISUAL QUALITY OBJECTIVES						
- Preservation	Thousand Acres	0	98	0	0	0
- Partial Retention	Thousand Acres	98	0	0	16	39
- Modification	Thousand Acres	0	0	98	82	59

WILDLIFE						
- Wildlife Habitat Improvement	Acre Equivalents					
-1982-1990		110	0	290	100	100
-2021-2030		110	0	320	100	100

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	(Preferred)				
		ALT <u>1</u>	ALT <u>2</u>	ALT <u>3</u>	ALT <u>4</u>	ALT <u>5</u>

WILDLIFE (continued)

- Elk Population Potential 1/ -1982-1990	Number	100	100	100	100	100
-2021-2030		100	100	100	100	100
- Total Land Harvested in Undeveloped Areas by 2030	Acres					
-Nonwinter range		0	0	12000	4830	7300
-Winter range		0	0	0	770	1300
- Average Annual Prescribed Burning for Wildlife Habitat Improvement	Acres	30	0	120	40	30
- Elk Hunter Recreation -1982-1990	Hunter Days	1000	1000	1000	1000	1000
-2021-2030		1000	1000	800	900	900

RANGE

1982-1990	AUMs	3,000	3,000	3,000	3,000	3,000
2021-2030		3,300	3,000	3,600	3,600	3,300

1/ Estimate of maximum number of elk that would use the area a portion of the year.

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	(Preferred)				
		ALT <u>1</u>	ALT <u>2</u>	ALT <u>3</u>	ALT <u>4</u>	ALT <u>5</u>

TIMBER

- Allowable Sale Quantity	Million Board Ft.					
-1982-1990		0	0	.4	.4	.4
-1991-2010		0	0	0	0	1.6
-2001-2010		0	0	.2	.2	.2
-2011-2020		0	0	3.9	2.1	1.1
-2021-2030		0	0	5.3	1.9	3.4
- Acres Harvested	Acres					
-1982-1990		0	0	40	40	50
-1991-2000		0	0	0	0	210
-2001-2010		0	0	20	20	30
-2011-2020		0	0	480	260	140
-2021-2030		0	0	660	240	430
- Acres Available, Capable, Suitable	Thousand Acres	0	0	46.1	49.9	44.8

LANDS

- Lands Required for Right-of-Way	Miles	20	0	48	48	38
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RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	(Preferred)				
		ALT <u>1</u>	ALT <u>2</u>	ALT <u>3</u>	ALT <u>4</u>	ALT <u>5</u>

FACILITIES

- Disturbance from Roading	Acres					
Arterial and Collector						
-1982-1990		0	0	5.6	5.6	5.6
-1991-2000		0	0	0	0	10.5
-2001-2010		0	0	3.5	3.5	3.5
-2011-2020		0	0	21.7	25.5	7.0
-2021-2030		0	0	32.2	25.5	21.7
Local						
-1982-1990		0	0	5	5	5
-1991-2000		0	0	0	0	10
-2001-2010		0	0	5	5	5
-2011-2020		0	0	20	15	10
-2021-2030		0	0	35	15	20

SOCIAL/ECONOMIC

- Change in Employment						
1982-1990	Person	0	0	5	5	5
2021-2030	Years	0	0	70	25	45
- Change in Income						
1982-1990	Thousand	0	0	80	80	80
2021-2030	Dollars	0	0	990	360	640
- Change in Population	People					
1982-1990		0	0	12	12	12
2021-2030		0	0	161	57	103
- Change in Sense of Control/Self-Sufficiency	Index*					
-Less Development		+3	+3	-3	-3	-2
-Nonwilderness		-1	-3	+3	+3	+2
-Wilderness		-1	+3	-3	-3	-2
-Timber		-2	-3	+3	+2	+1
- Change in Symbolic Meaning	Index*					
-Economic Maximum		-2	-3	+3	+2	+2
-Nature/Refuge		+2	+3	-3	-3	-2

<u>RESOURCE USE AND DEVELOPMENT FACTORS</u>	<u>UNITS</u>	(Preferred)				
		<u>ALT 1</u>	<u>ALT 2</u>	<u>ALT 3</u>	<u>ALT 4</u>	<u>ALT 5</u>

SOCIAL/ECONOMIC (Continued)

- Change in Emotional/ Spiritual Renewal	Index*					
- Human Activity		0	+3	-3	-2	-1

* Factors which reduce the expression of these social variables are shown with a (-) and factors which heighten the expression of these variables are shown with a (+). The numbers 1, 2, and 3 are a relative ranking; 1 is the least and 3 is the most. Factors which are neutral are represented by a (0). A discussion of these social variables is given on pg. 3-21.

DISPERSED RECREATION

The Dispersed Recreation Program maintains an environment for outdoor recreation opportunities. Specific activities include posting signs, clean-up, visitor information services, and patrolling for public safety.

Table 4.2 summarizes the changes in recreation setting over 50 years. Dispersed recreation opportunities occur on primitive, semi-primitive, and roaded natural areas.

Recreation

Alternative 1 (Preferred) maintains a semi-primitive recreation setting. Alternative 2 would give the area wilderness classification, which would prohibit motorized recreation. This would have a significant affect on local users as the Big Snowies provides most of this type of use on public lands for Lewistown and surrounding areas. Alternative 3 would change the recreation setting on the entire 97,885 acres from a semi-primitive to a roaded natural setting. Alternative 4 is similar to 3, except 16,000 acres would remain in a semi-primitive recreation setting. Alternative 5 would change the recreation setting on 58,845 acres from a semi-primitive to a roaded natural setting.

Wildlife

Semi-primitive recreation management provides more secure habitat for wildlife species which prefer areas with less roading and resource development. Increases in motorized recreation will displace some wildlife, especially big game. Road and trail closures will help protect wildlife in critical areas (Lyon, 1982).

Timber

Maintaining primitive (wilderness) or semi-primitive recreation opportunities decreases the volume of timber available for harvest. No timber harvest would occur under Alternatives 1 (Preferred) and 2. Alternative 3 would offer the largest amount of timber for harvest, and Alternatives 4 and 5, in that order, would offer less timber for harvest.

Soil and Water

Undeveloped campsites and other heavily used areas may adversely affect soil and water in localized areas, causing erosion, soil compaction, and water quality degradation (Cole and Schreiner, 1981). Dispersed recreation can also result in fecal pollution of water (Pacha, 1981). Off-road vehicles adversely impact soil and water in heavy use areas. These effects occur throughout the Forest where the terrain and vegetation permit this type of use.

Protection

Because recreation use levels are expected to increase, the number of person-caused fires would also increase. This adverse affect would be the same for all alternatives.

VISUAL RESOURCE

The Visual Resource Program determines how much the natural landscape may be modified by various activities, such as timber harvesting and mining. Categories or objectives are preservation, retention, partial retention, and modification of the natural landscape. Objectives are determined in part by how visible areas are from population centers, major highways, roads, trails, campgrounds, and other recreation developments. Table 4.2 shows the number of acres within each of the visual quality objectives.

Because the Snowies is a small range, which rises abruptly from the plains, the study area is in clear view of U.S. Highways 12, 87, and 191. However, the distance from the Snowies to these highways would reduce visual impacts from resource or other activities.

Visual Quality

The natural landscape would be preserved under Alternative 2, although Alternative 1 (Preferred) retains the landscape much as it is. The landscape would be modified under Alternatives 3, 4, and 5. Short term impacts from timber harvest and roads could be mitigated by scheduling treatments which would be spaced and timed so that adverse visual impacts are minimized (USDA-Forest Service, National Forest Landscape Management 2:50 (Timber), 1980).

Social and Economic

Even though most visual quality objectives can be met without prohibiting other resource activities, added care and cost is usually needed to meet the more restrictive objectives. Alternatives 3 and 4 harvest more timber in visual sensitive zones. Thus, the costs to harvest the timber are greater due to special road standards and additional logging requirements.

WILDERNESS

The Wilderness Program provides for protection and preservation of large areas in their natural state. Primitive recreation takes place within classified wilderness and this opportunity can be maintained with no additional impacts on the environment.

Table 4.2 shows the acres in wilderness for each alternative. Alternative 2 is the only alternative with recommended wilderness; thus, the only alternative affected by the Wilderness Management Program.

Recreation

Recommended wilderness under Alternative 2 would shift the present semi-primitive recreation opportunity to primitive recreation. Opportunities for both primitive and semi-primitive recreation are high. Under wilderness classification, the area would be closed to motorized recreation. There would be a loss of 1,700 RVDs of motorized recreation per year. A wilderness recommendation may lead to a small increase in the amount of recreation use because more people would seek recreation in these areas (Hendee, Stankey, and Lucus, 1978).

Timber

Timber harvesting opportunities, averaging 3.4 million board feet per year, will be foregone in Alternative 2. In order to maintain the Forest's harvest level, other areas would need to be more intensively managed.

Soils & Water

Alternative 2, wilderness classification, would protect the watershed and the soils from resource activities.

Diversity

Vegetative diversity may decrease. Natural diversity is high in the study area; both climax timber and grassland species are present. Management fire in wilderness would be used as a natural method of managing vegetation and maintaining diversity. Alternative 2 would fill the target for the Foothills Prairie Ecosystem in the National Preservation System.

Protection

Under wilderness classification (Alternative 2), the risk of mountain pine beetle infestations reaching epidemic levels would increase significantly (Wellner, 1973). Currently much of the timber resource is mature or overmature lodgepole pine which is susceptible to the insects. The potential for Douglas fir beetle and spruce beetle infestations are not considered to be significant.

Air Quality

Management fire in wilderness (Alternative 2) will be within the standards of the State of Montana Cooperative Smoke Management Plan.

Minerals

Access for mineral activities would be subject to restrictions under wilderness and could increase the costs to miners. Mineral potential for base and precious metals is low in the Big Snowies. The southern half of the range has a potential for accumulation of oil and gas (Clements). Under Alternative 2 (wilderness) the area would be withdrawn from all forms of mineral entry subject to valid existing rights (Wilderness Act of 1964). Development and production would be allowed on claims with valid discoveries made prior to the withdrawal date.

Timber

Timber harvesting opportunities, averaging 3.4 million board feet per year, will be foregone in Alternative 2. In order to maintain the Forest's harvest level, other areas would need to be more intensively managed.

Social and Economic

Increased visitors, due to the wilderness classification, could help the local economy and other recreation-related businesses.

The social variable of sense of control and self-sufficiency would be affected by the wilderness designation of the study areas. Those people who do not want wilderness designation would feel a loss of control by Alternative 2 and increased control in the other alternatives. This would be especially true in nearby Lewistown where most of the users reside. The same alternatives would create the opposite feelings of those people wanting wilderness designation.

Social benefits in wilderness classification under Alternative 2 would exist, especially for people who enjoy nonmotorized use. People recognize the intrinsic benefits of having a pristine environment nearby, such as being able to "get away from it all;" having plants and animals in their natural state for observation, hunting, fishing, backpacking, and hiking in an environment without the impacts of man; and just knowing that an undeveloped area is nearby. Wilderness classification would help improve the distribution of wilderness in Montana.

Wilderness designation would result in the area being managed to leave it unimpaired for future generations use and enjoyment. It would provide valuable opportunities for research and study of natural life processes which are largely undisturbed by man.

Other Alternatives

Alternative 1 (Preferred), 3, 4, and 5 forego the opportunity for wilderness classification at this time. Alternative 1 (Preferred) would retain the opportunity for future wilderness classification on all 97,885 acres. Alternative 3 would have high commodity develop so there would be no opportunity for future wilderness classification. Alternative 4 would retain the opportunity for future wilderness classification on 16,000 acres and Alternative 5 on 39,040 acres.

WILDLIFE AND FISH

Wildlife and fish management is the maintenance and improvement of wildlife and fish habitat. Activities include vegetation management for increasing the amount of shrubs, forbs, and grass available to various animals, as well as protecting some sites as they exist for species depending upon an "old growth" environment. Maintaining security cover for some animals and minimizing the disturbances of human activity in calving areas, migration routes, and T&E species habitat are also objectives. Activities in fisheries management include minimizing sediment in streams, fish structure maintenance, and channel stabilization.

Table 4.2 lists wildlife habitat improvements. Elk populations are reported to reflect habitat capacity.

All alternatives, except Alternative 2 (wilderness), have wildlife and fish habitat programs. However, the wildlife program for Alternative 3 is primarily to mitigate some of the adverse effects from other resource activities, such as roading and timber harvesting.

Under all alternatives, elk numbers will not be affected. The small elk herd provides limited hunting opportunity on a permit basis.

Recreation

A change is projected in hunter recreation under the alternatives that propose development (3, 4, and 5). Table 4.2 shows hunter recreation by alternative.

Protection

Prescribed burning to revert back to an earlier successional stage would have a long-term benefit for the wildlife resource, by maintaining a high level of forage production (Fisher and Clayton, 1982). All alternatives, except Alternative 2 (wilderness) use prescribed burning for habitat improvement. Burning would meet the State Air Quality Standards.

Social and Economic

The wildlife and fish management program has both beneficial and adverse effects on the economy of the state and surrounding communities. Beneficial economic effects of intensive wildlife management would be an increase in recreation opportunity and visitors. This would cause an indirect effect of increasing income to the local economies. Alternative 2 would provide the most benefit.

Wildlife habitat programs can have an adverse economic impact on timber harvesting, ranching, and mineral activities. The cost of doing business can increase as specific measures and structures are needed to mitigate adverse effects on big game populations, and other wildlife and fish.

Under Alternatives 3, 4, and 5, big game values and development would often be in conflict.

RANGE

The Range Management Program provides for efficient livestock grazing on forest and rangeland commensurate with other needs. Activities include managing range permits, monitoring range use, and maintaining and constructing range improvements, such as fences and water developments.

Table 4.2 shows the acres grazed by livestock for each alternative.

Soils & Water

All alternatives, except Alternative 2, increase grazing over a 50-year period. Mitigation measures are listed in the management practices, standards, and guidelines for grazing in riparian zones. (See Lewis and Clark Forest Plan.) Proper livestock distribution would be achieved through the placement of salt and construction of fences.

Range Improvement

Burning to change the vegetation to an early successional stage would have a long term benefit by maintaining a high level of forage production. (Fisher and Clayton, 1982). Alternatives 1 (Preferred), 3, and 4 burn the most acres by prescription for range management.

Constructing fences and water developments improves livestock distribution, provides additional grazing use, reduces overused areas, and improves the vigor and production of forage.

Wildlife & Fish

Livestock grazing has an adverse effect on big game -- primarily where grazing occurs on big game winter range.

Although population would not be affected, elk would be affected somewhat under Alternatives 1 (Preferred), 3, 4, and 5 which provide for increases in livestock AUMs. The increases in AUMs would occur on both winter and summer big game range. Competition between livestock and elk could have an adverse effect on elk on summer ranges (Thomas and Towell, 1982). As livestock allocations increase, there would be less opportunity to mitigate adverse impacts on big game.

Social and Economic

All alternatives, except Alternative 2, increase livestock grazing to provide more beef, lamb, and wool to the consumer. This would increase income to the local ranchers and increase grazing receipts to the U.S. Treasury. Alternatives 3 and 4 would increase grazing by 33 percent over the current level. Alternatives 1 (Preferred) and 5 would increase grazing by 22 percent over the current level.

An increase in grazing opportunity over time for all alternatives, except Alternative 2, has a beneficial effect upon the ranching operations by assuring a constant supply of grazing land. While the percentage of grazing provided by the Big Snowies is not large in comparison with total Forest grazing, the increases in grazing does have some economic benefit to the local area.

TIMBER

The Timber Management Program ensures the growth and use of the timber resource for the benefit of the Nation. Activities include scheduling timber harvest, administering timber sales, and improving stands by thinning, site preparation, and planting. Road construction and maintenance, an activity closely associated with timber harvest, is discussed under Facilities. Table 4.2 gives the harvest volumes, the acres harvested, and acres available, capable, and suitable for timber management.

The Preferred Alternative (1) does not program any regulated timber harvest in the Big Snowies Study Area. About 98 million board feet would be available during the 50-year planning period if this area was fully developed under Alternative 3. Full development would require a high investment in roads and rights-of-way to access. The failure to harvest timber periodically is an irretrievable loss of products. Alternative 4 would harvest 46 million board feet and Alternative 5, about 67 million board feet.

Wilderness classification (Alternative 2) would prohibit harvesting timber except for wilderness or mineral purposes.

Soils & Water

Water yield from Alternatives 3, 4, and 5 is less than a 2 percent increase per decade. This change is less than the annual variation in water yield due to natural factors. These alternatives would also have the highest levels of sedimentation. Mitigation measures to prevent soil erosion from timber harvest would include directional felling of trees, waterbarring on skid trails, and seeding on landings.

Recreation

Alternatives 3, 4, and 5 would develop the most land for motorized use. The Preferred Alternative (1) would maintain the study area in a semi-primitive setting.

Favorable social effects of increased roading include increased opportunity for recreationists who enjoy motorized use, although this would depend on the road management for the area. Timber harvest would adversely affect those people who enjoy an unroaded recreation setting and a natural landscape.

Air Quality

Under Alternatives 3, 4, and 5, prescribed fire would be used for stocking control and disposal of activity fuels. Burning would meet the State Air Quality Standards, in compliance with the Clean Air Act of Montana.

Visual Quality

Timber management activities have significant effects on visual quality. Although the impacts of timber management are generally short term, the immediate change to the existing landscape is undesirable to many Forest visitors. The establishment of visual quality objectives provides the method for carrying out timber management and other activities while protecting the visual resource. Treatments would be spaced and timed so that adverse visual impacts are minimized. Alternatives 3 and 4 would have the greatest potential for disruption of the visual resource.

Wildlife & Fish

Timber harvest provides wildlife forage and habitat diversity by creating different forest age classes. Timber harvesting reduces hiding and thermal cover and primarily impacts fall big game ranges. The Preferred Alternative (1) would maintain big game security habitat on 97,885 acres. Alternatives 3, 4, and 5 would affect security habitat.

Wildlife species associated with old growth could be adversely affected under Alternatives 3, 4, and 5. Less acres would be maintained as old growth which would decrease habitat available for these species. Habitat for wildlife species using the grass/forb stage would increase under these alternatives. Human use, equipment operation, and other noises associated with timber harvesting activities could have a short term effect on the distribution of wildlife.

Range

Timber management is the greatest contributor to habitat modification. Additional forage for wildlife and livestock can be created through timber harvesting (Basile and Jensen, 1971). Alternatives 3, 4, and 5 would increase transitory range for livestock.

Protection

Timber harvesting would be used to control insects and disease, particularly in Alternatives 3, 4, and 5. Under these alternatives, the Forest would be less susceptible to mountain pine beetle attacks because more acres are in a variety of age classes created through timber management activities.

Alternatives 1 and 2 provide for the least protection from mountain pine beetle infestation.

Accumulation of fuels results from timber harvest and increases the risk of forest fires (Smith, 1962). This effect would be mitigated under all alternatives by piling and burning the slash (FEIS, Northern Region Slash Disposal Program, 1974).

Social and Economic

Increased timber harvest would help meet the demand for wood products and help stabilize timber dependent communities. The Preferred Alternative (1) would not contribute to the Forest's Timber Sale Program. Alternatives 3, 4, and 5 would increase employment, personal income, and county and federal receipts.

The economic benefits generated under Alternatives 3, 4, and 5 would help to increase the sense of control, self sufficiency, and cohesion within timber dependent communities, such as Judith Gap, by producing a more optimistic economic outlook which could increase community spirit. Alternatives that increase harvesting would help relieve the uncertainty for the timber industry.

**MINERALS
OIL AND GAS**

The Minerals Program administers mineral exploration and development on National Forest System lands. Oil and gas exploration and development is carried out by private companies under a land leasing program. The BLM (Bureau of Land Management) is responsible for oil and gas leasing. The Forest Service reviews lease applications and recommends to the BLM what National Forest lands should be leased and what controls (stipulations) are needed to protect surface values and uses.

Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration or exploratory drilling for any given lease block (a collection of leases held by one company). Recent information indicates the Big Snowies Study Area has a definite potential for gas and oil accumulations. Applications have been made for leasing approximately 50,000 acres within the study area.

Alternatives 3, 4, and 5 would increase the opportunity for exploration and development of potential gas and oil reserves. These alternatives would also have the greatest effect on the environment as described in this section. Alternative 1 (Preferred) would provide less opportunity for oil and gas exploration and development because semi-primitive recreation areas would be protected by recommended leases with stipulations for limited surface use and timing restrictions.

Alternative 2 (wilderness) would be the most restrictive. On January 1, 1984, the area would be withdrawn from all forms of mineral entry, subject to valid existing rights. Presently applications for oil and gas leases can be filed within the area. However, the Forest Service has no authority to process or issue leases. Opportunity for oil and gas exploration would be foregone under Alternative 2 (wilderness). Mining claims can be filed until January 1, 1984. After that the area is withdrawn from further mineral entry. All claims filed previous to the date are subject to existing rights.

Soils & Water

Soil productivity may be adversely affected by off-road vehicle travel. This can be avoided by limiting off-road travel to dry periods, during the summer and fall, and by avoiding compaction prone soils.

Seismic exploration is done in such a way as to have only minor effects on soil and water.

Construction of roads, drill pads, and other facilities would result in soil disturbance and would require measures to prevent erosion and increased sediment in streams.

Air Quality

The effects on air quality are generally short term and minor. Dust from trucks and other equipment is a minor impact. A cloud of smoke and dust from each blast when explosives are used on the surface would quickly dissipate.

Vegetation

The method, type, and amount of explosive used would vary the amount of vegetative disturbance. Vegetation that is damaged by surface explosives would grow back in a relatively short time depending on the time of year, amount of soil moisture, and type of vegetation. There would be little change in species composition. Drilling would disturb the vegetation and require some reclamation.

Drill pads and road construction would result in destruction of existing vegetation. The relatively small area disturbed by oil and gas activities should have little effect on native plant communities. Disturbed areas would be seeded with native grasses and shrubs.

Recreation

Oil and gas activities would affect the quality of the recreation setting. The effect would be particularly noticeable in semi-primitive settings, where the introduction of roads and motorized use would be distracting. Some business operations, such as outfitters and guides, could be adversely affected by the disruption of the semi-primitive recreation setting by oil and gas activity. Traditionally used campsites would be protected by non-occupancy stipulations (Environmental Assessment on Oil and Gas Leasing on Nonwilderness Lands, 1980).

Noise from helicopters transporting personnel and moving equipment would take place during any portable seismic activity. Also, when surface charges are detonated, the noise from the blast may be audible for several miles, depending on the terrain and location of the operation (Environmental Assessment on Geophysical Exploration, 1982).

User conflict on roads may take place between the general public, log hauling traffic, and oil and gas exploration traffic.

Visual Quality

Standards for pad site and road reclamation are designed to return the setting to a natural condition. However, visual quality may be slightly lowered due to contrasting color and shape.

Wildlife

The timing and location of preliminary exploration and exploratory drilling activities in relation to key habitat use patterns would determine the significance of disturbances or displacement. The greatest potential conflict would be during use periods on key habitat, such as big game concentration areas and migration routes. Direct mortality from oil and gas activity is very unlikely. Wildlife habitat loss or degradation would be negligible during preliminary exploration (Environmental Assessment on Geophysical Exploration, 1982).

The sensitivity periods for big game are as follows:

Elk winter range	12/1 to 4/30
Elk calving areas	5/1 to 6/30
Mule deer winter range	12/1 to 4/30
Mountain goat winter range	12/1 to 4/30
Mountain goat kidding areas	5/1 to 6/30

Effects on wildlife would include possible destruction of habitat by road, drill pad, and other facility construction. The destruction of habitat could be significant if the habitat is important and limited.

Range

Human activity, blasting, and helicopter use may affect livestock habitat use patterns for short periods of time. Critical areas can be protected by non-surface occupancy stipulations.

Social and Economic

The preliminary exploration is usually done by persons from outside the local area. Demand for services in the Lewistown and Stanford communities would increase slightly during exploration.

Leasing National Forest lands for oil and gas exploration increases revenue to the Federal Treasury. Half of the revenue is returned to the State of Montana.

A discovery of oil and gas that would lead to production would have significant social and economic effects. Local community populations, employment, income, and community cohesion would change. Individual's lifestyles, job dependence, sense of control, self sufficiency, and feelings of certainty and uncertainty would be affected. The present unemployment rate would benefit from a discovery of oil and gas.

METALLICS

The Minerals Program administers the mineral exploration and development on National Forest System lands. Exploration and development of metallic or hardrock minerals are carried out by private companies.

Metallic mineral exploration and development could occur under all alternatives. However, the potential of a discovery or development is very low. Alternatives 1 (Preferred) and 2 would be more restrictive on metallic mineral activities.

Soils & Water

The mineral potential is low. Soil disturbance would require restoration measures, and special measures would be needed to prevent increased sedimentation in the local streams. Underground mining would create mine tailing disposal sites of 1 to 13 acres. Mitigating disposal sites would include site location away from water and landscaping around the disposal site. Access roads and trails would be constructed following the Forest Management Practices, Standards, and Guidelines in Lewis and Clark Forest Plan.

Wildlife and Fish

Small mammal and fish habitat could be eliminated in localized areas of placer and dredging operations. Revegetation measures would help mitigate adverse impacts in some situations (Wildlife Users Guide for Mining and Reclamation, 1982).

Human activity and noise of mining operations would displace big game in the immediate area. Hauling of ore from underground mines would increase traffic and could increase big game road mortality along migration routes.

Visual Quality

Mining operations within the proximity of arterial and collector roads could adversely affect visual quality. Any open slope or open pit mining would adversely affect visual quality.

Social and Economic

Alternatives 3, 4, and 5 would enhance the lifestyle and job opportunity of those economically dependent on mining while Alternative 2 would limit this lifestyle and opportunity.

SOIL AND WATER

Soil and Water Management Programs protect, conserve, and enhance the soil and water resources. Activities include monitoring water quality, quantity, and the effects of activities on soil. Other activities protect the resources, where needed, with structural improvements and other mitigating actions.

Social and Economic

More structural improvements would be needed to maintain soil and water quality. These improvements would cause a slight increase in cost to grazing operations.

Timber

Alternative 3 is the only alternative that allows timber harvest in riparian areas on a regulated basis. Forest guidelines (Lewis and Clark Forest Management Plan) for selection cutting, cabling, and slash piling must be followed to prevent soil and water degradation. Such guidelines would increase harvest cost in riparian zones.

LANDS

The Lands Program deals with special-use management, land adjustment planning, land exchange and acquisition, and rights-of-way acquisition.

None of the alternatives would have significant effect on private lands.

Alternatives 1 (Preferred) and 2 would require approximately 20 miles of rights-of-way to the 80 miles of existing trails. Alternatives 3 and 4 would require 48 miles of rights-of-way and Alternative 5, 38 miles.

Private citizens whose lands are involved in rights-of-way may be adversely impacted. These effects include possible range management problems, such as the need for additional fencing. Also with the public in close proximity to private lands, littering and vandalism problems could result.

Favorable economic and social effects would be more public lands available for a variety of uses, such as recreation and firewood gathering.

**FACILITIES - ROADS
AND TRAILS**

The Facilities Program provides and maintains capital improvements such as roads and trails. Transportation planning; road engineering and design; and construction and maintenance of local, collector, and arterial roads and trails are all activities included in facilities management.

Table 4.2 shows the acres disturbed from roading by alternative. The Big Snowies would require many roads to access the rounded basins and ridgetops. Many roads would serve only a single drainage. Alternatives 3, 4, and 5 would provide roads in the Big Snowies Study Area to support timber harvest activity.

Soils & Water

Roading may have an adverse long term, irretrievable effect on the physical environment (Megahan 1972-1975; Megahan and Kidd, 1972). Road construction causes the disturbance and removal of the soil which can result in soil erosion, increased stream sediment, and diminished water quality. This effect varies by the amount of road constructed and by the type of soil. Trail construction has similar effects, but to a much lesser degree. Mitigation measures to minimize these effects are outlined in management practices, standards, and guidelines for each management area. (See Lewis and Clark National Forest Management Plan.) Alternatives 3 and 4 show more acres disturbed by roading than Alternative 5.

Fish & Wildlife

Road management is a critical element to wildlife, particularly for big game species. Road construction removes vegetation or wildlife forage; however, the critical effect is the increased access people have to the Forest. Human activity and encounters with wildlife can disturb elk calving areas, migration routes, forage areas, and security cover. Potential effects include displacement of animals from their historically used ranges, poaching, and less protection from hunters. Trails management presents some of the same effects, but again to a much lesser degree. Alternatives 3 and 4 have the most roads. Alternatives 3, 4, and 5 recommend closing new roads in critical wildlife habitat. Alternatives 1 and 2 would have no disturbance from new roads. Alternative 2 (wilderness) would close 50 miles of existing roads.

Recreation

Table 4.2 shows the acres maintained by the different recreation settings. Alternatives with the highest timber harvest levels would cause the greatest change in recreation settings. Road construction would affect recreationists by changing the recreation setting from a semi-primitive to a roaded natural setting. This would be considered a long term effect, even though it could be reversed through road closures and restoration of roadbeds. Roothing in turn would affect the types of recreation activities and user groups. Roads and trails would increase the motorized recreation opportunity for snowmobiling and trail biking.

Visual Quality

Road construction would create visual impacts by removing vegetation and disturbing the soil, thus changing the color, texture, and lines of the landscape (USDA - Forest Service, National Forest Landscape Management, Roads 2(4), 1977). In open areas, roads introduce strong lines into the landscape that can be visible for many miles depending on topography and vegetation. These impacts would not be as great for alternatives which harvest less timber. Visual management objectives provide for mitigating measures to reduce the effects of roading.

Protection

Because roading provides greater access to the Forest, more timber stands which are susceptible to insects and disease may be harvested. Alternatives 3, 4, and 5 provide the greatest opportunity to harvest stands, whereas Alternatives 1 (Preferred) and 2 have the least. Increased roading would increase human activity which in turn increases the risk for person-caused wildfire.

Social and Economic

Roothing can have indirect economic benefits to timber, ranching, and mining operations, since it provides access to timber, rangeland, and minerals. Ease of access reduces the cost to the operation while increasing the supply of the commodity.

Roothing could have an adverse effect upon the symbolic meaning people may attach to the roadless, natural setting of the Big Snowies. On the other hand, roading can provide greater opportunities for people to enjoy the area or derive economic benefit. Road management, such as road closure and careful placement of roads, can mitigate some adverse effects.

PROTECTION - FIRE

The Fire Management Program includes the prevention and suppression of wildfires, the use of fire to dispose of activity-created fuels, and fire to improve resource values.

All alternatives provide for an increase in prescribed burning. Those alternatives that provide for the larger amount of prescribed fire have the greatest potential for reducing acreage burned by wildfire. Wildfire burned acreage should also be reduced in decadent lodgepole pine by scheduling timber harvests in high hazard fuels with subsequent debris disposal. Alternative 3 provides for the largest amount of harvest followed by debris disposal. Alternative 2 (wilderness) would provide the most opportunity for certain unplanned ignitions to more nearly play their natural role when meeting pre-established criteria.

Table 4.2 shows the average annual planned prescribed burning for each alternative.

The Level I Fire Management Analysis Report describes in detail the environmental consequences of prescribed fire and wildfire on the ecosystem of the Lewis and Clark National Forest. Other documents that describe environmental consequences in more detail are:

Fire Ecology of Eastern Montana Forest Habitat Types, Editorial Draft, January 1982, Intermountain Forest and Range Experiment Station, USDA, Forest Service, Fischer and Clayton.

Environmental Assessment - Fire Management and Protection Program for the Scapegoat Wilderness and Danaher Portion of the Bob Marshall Wilderness, January 1981, USDA, Forest Service.

Final Environmental Statement - Fire Management in the Selway-Bitterroot Wilderness - A Proposed Policy change, December 1976, USDA, Forest Service.

Final Environmental Statement - Northern Region's Slash Disposal Program, November, 1974, USDA, Forest Service.

The use of prescribed fire for resource improvement and debris disposal is also discussed under each resource element where it occurs.

According to these documents, prescribed fire for the improvement of resources and for the reduction of the wildlife hazard has excellent potential on the Lewis and Clark National Forest with only minor adverse impacts. These impacts can all be mitigated using Standard Operating Procedures described in the Fuel Management Planning and Treatment Guides, July 1981, Northern Region, USDA, Forest Service.

**PROTECTION - INSECT
AND DISEASE**

The effects of insects and disease are discussed throughout the chapter.

**SOCIAL AND ECONOMIC
CONSEQUENCES**

National Forest lands in Montana exert a strong economic influence on local communities and the people who live there. The Big Snowies are no exception. The study area is different, however, because the ratio, on a county wide basis, of private land to public lands is much higher than in other areas of the State. Therefore, the role played in the local area's economy by National Forest management, although important, is relatively small. Impacts are primarily confined to two resource areas: timber and range.

Table 4.2 shows the changes in employment, income, and population by Alternative. Also shown are the change in social traits which are discussed throughout this chapter.

Population

Alternatives 3, 4, and 5 would result in a population increase. These population increases may effect small communities such as Judith Gap, which has a small wood processing mill.

An increased density of homes on private lands would conflict with some residents' sense of appropriate private land use.

Employment

Alternatives 1 (Preferred) and 2 would not significantly effect job opportunity.

Recreation use under Alternatives 1 (Preferred), 3, 4, and 5 would probably not significantly change employment opportunities. Wilderness classification (Alternative 2) could attract additional users, but would not cause any major economic effect.

Job opportunities in the ranching sector are limited because farms and ranches can support only a given number of people. Maturing youth will continue to look outside of the area for jobs. This has led to an older population structure in the past and will continue to do so in the future. These age differences will continue to have effects on recreation preferences. While the 600 AUM grazing increase under Alternative 1 (Preferred) is significant in the management of the Big Snowies, it would have little effect on the overall ranching sector.

Income

Like population and job opportunity, income effects are related to the output of the timber resource. Alternatives 3, 4, and 5 would increase the income to the area. These alternatives would provide a beneficial effect to local area income.

FEIS
MONTANA WILDERNESS
STUDY ACT AREAS

CHAPTER V
LIST OF PREPARERS

Overview

This chapter lists those people who were primarily responsible for preparing this FEIS.

List of Preparers

Management Team

<u>Responsibility</u>	<u>Member</u>
Forest Supervisor (1978-1979)	Ken Weyers B.S. Range Management; 22 years experience in forestry, range management, and administration.
Forest Supervisor (1980-Present)	J. Dale Gorman B.S. Forest Management; 19 years experience in forestry and administration.
District Ranger Rocky Mountain RD	Lloyd Swanger B.S. Forestry; 26 years experience in forestry and administration.
District Ranger Judith RD	Larry Froberg B.S. Forest Management; 17 years experience in forestry, forest management, and administration.
District Ranger Mussellsell RD	Carl Fager M.F. Forest Management; 16 years experience in forestry, forest resource management, and administration.
District Ranger Kings Hill RD	Ron Primozic B.S. Forestry; 23 years experience in forestry, fire management, resource management, and administration.
Range/Wildlife/ Recreation Staff (1978-1981)	Darrol Harrison B.S. Forestry; 21 years experience in forestry, range, and administration.
Range/Wildlife/ Recreation Staff (1981-Present)	Mike Goggin B.S. Forest Management; 22 years experience in forestry and administration.
Timber/Fire/State and Private Forestry Staff	Paul Hightree B.S. Forestry; 24 years experience in forestry, fire, and administration.
Land Management Planning/ Information Staff	John Skinner B.S. Forestry; 18 years experience in forestry, land management planning, and administration.
Planning Team Leader (Resource and Systems Core Groups) (1978-1981)	

List of Preparers

Management Team (cont'd)

Responsibility

Member

Qualifications and Experience

Land Management Planning/
Information Staff

Dick Smith
B.S. Wildlife Technology; 20 years experience in forestry, long range and special planning, and administration.

Planning Team Leader
(Resource and Systems
Core Group)
(1981-Present)

Soil/Water/Air/Minerals
Staff

Herb Holdorf
B.S. Agronomy; 19 years experience in soil science and administration.

Soil Inventory (Resource
Core Group)
(1978-1981)

Soil/Water/Air/Minerals
Staff (1981-Present)
Minerals Inventory,
Analysis, and Planning
(Resource Core Group)

Chuck Frey
B.A. Geology; 8 years experience in geology, minerals, and administration.

Administrative Officer

Paul Threlkeld
B.S. Accounting; 17 years experience in budget and finance and administration.

Forest Engineer

Bill Duryee
B.A. Education, B.S. - Civil Engineering; 22 years experience in civil engineering and administration.

Resource Core Group

Responsibility

Member

Qualifications and Experience

Silviculture
Timber Inventory and
Analysis
(1978-1981)

Dwight Chambers
B.S. Forestry (Range Option); 13 years experience in silviculture and forestry.

Timber Inventory,
Analysis, and Planning

Jim Eakland
B.S. Forestry; 27 years experience in forestry and timber planning.

Wildlife Inventory,
Analysis, and Planning

Roger Evans
B.S. Wildlife Management; 20 years experience in range, wildlife management, and administration.

List of Preparers

Resource Core Group (cont'd)

Responsibility

Member

Qualifications and Experience

Hydrology, Inventory,
Analysis, and Planning
(1981 - Present)

Val Hancock
A.S. Forestry, B.S. Watershed Management,
M.S. Range Management; 15 years experience in ~~range~~
and hydrology.

Silviculture
Timber Analysis
(1981 - Present)
1983

Cecil Kassing
B.S. Forestry, CEFES Certified; 20 years
experience in forestry and silviculture.

Minerals Analysis and
Planning

Nancy Kidd
B.S. Geology; 9 years experience in geology and
minerals.

Recreation Inventory,
Analysis, and Planning
Land Exchange, Right-
of-Way (1982-Present)

Ed Kinsman
B.S. Forestry; 29 years experience in forestry,
administration, and recreation.

Range Inventory, Analysis
and Planning

Wayne Phillips
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experience in range management.

Transportation Inventory,
Analysis, and Planning

Dale Schaeffer
B.S. Construction Engineering Technology; 9 years
experience in civil engineering and transportation
planning.

Minerals Inventory,
Analysis, and Planning

Mark Weber
B.S. Geology, M.S. - Geology; Ph. D. Geology;
20 years experience in geology, minerals, and
administration.

Fire and Fire Planning

Everett M. Stiger
B.S. Forest Management; 25 years experience in
forest management and administration. The last 5
years has been exclusively in fuels management,
fire ecology, and fire management planning.

Systems Core Group

Responsibility

Member

Qualifications and Experience

Social Inventory and
Analysis

Palmer Bowen
B.A. General Psychology, Graduate work in
Industrial Psychology and Management; 4 years
experience in Industrial Psychology and Social
Science analysis.

LIST OF PREPARERS

Systems Core Group (cont'd)

<u>Responsibility</u>	<u>Member</u> <u>Qualifications and Experience</u>
Operations Research Analysis (FORPLAN) Economics Alternative Analysis	Dave Cawrse B.S. Forest Resource Management, M.S. Forest Economics; 3 years experience in operations research, forest economics, and management planning.
Public Involvement Coordination Analysis of the Management Situation Alternative Analysis Writing/Editing Documentation	Michael Cushman B.A. English; 7 years experience in planning, public information, writing, editing, and administrative management.
Work Plan Analysis of the Management Situation	Steve Solem B.S. Forestry, B.A. Geography; 8 years experience in forestry, planning, and administration.
Inventory and Data Base Alternative Analysis Analysis of the Management Situation	Bill Timko B.S. Forestry, M.F.S Forest Science; 6 years experience in forestry and planning.
Analysis of the Management Situation	Sharon Dolezal B.S. Forestry, M.S. Forestry; 3 years experience in forestry and planning.
Other Specialists	
Cartography and Mapping	Karen Cramer Undergraduate work in graphics and art; 5 years experience in cartography.
Land Exchange and Rights- of-Way (1981-1982)	George Racely B.A. Forestry, B.S. Range Management; 33 years experience in forestry, range, lands, and real estate appraisal.
Technical Writing	Suzanne Birchard B.S. Forestry; 5 years experience in forestry.

FEIS

MONTANA WILDERNESS
STUDY ACT AREAS

CHAPTER VI

LIST OF PERSONS, AGENCIES, ORGANIZATIONS,
TO WHOM COPIES OF FEIS ARE SENT.

MAILING LIST

There is a 200 name computerized mailing list that will be included in the FEIS.

FEIS

MONTANA WILDERNESS
STUDY ACT AREAS
CHAPTER VII
CONSULTATION WITH OTHERS

Overview

This chapter highlights public involvement and summarizes public comment on the Middle Fork Judith and Big Snowies Wilderness Study Area. Also listed is the Forest Service response to concerns raised on these areas. A summary of changes made in the Draft Study Report is also given.

PLANNING COORDINATION

PLANNING COORDINATION

The Middle Fork Judith and Big Snowies were studied for wilderness suitability as part of the Lewis and Clark National Forest Land and Resources Planning Process. From the outset of the Middle Fork Judith and Big Snowies Wilderness Study, Federal, State, and local agencies and interested publics have been informed of the study. Letters, study updates, news releases, and public meetings were all used to distribute information. In addition, many groups have corresponded and had meetings with the Forest when necessary. These actions are documented in the Forest planning records.

The following are those whom the Forest has worked with in its study effort:

Bureau of Land Management
Minerals Management Service
Governor's Review Committee
Montana Department of Fish, Wildlife, and Parks
Montana State Clearinghouse
Governor's Resource Council
Lewis and Clark Grazing Advisory Board
Wilderness Society
Wildland and Resource Association
Western Environmental Trade Association
Inland Forest Resource Council
Eastside Timber Practices Committee
Rocky Mountain Oil and Gas Association, Inc.

INTRODUCTION

The public review period for the Draft Study Report began on July 26, 1982. The original 95 day comment period was extended by 45 days, to December 5, 1982. During this time 800 Draft Study Reports were distributed to Federal, State, and local agencies and interested publics. Copies were also made available for review at Forest Service offices and local libraries.

Public Hearings

Hearings were held in Great Falls and Lewistown, Montana. Public notices of the proposal and the hearings were published in the Federal Register and in several Montana newspapers. Copies of the notices were also posted in public places. About 100 people attended the two hearings; 28 people spoke in Great Falls and 14 people spoke in Lewistown. Another 93 respondents submitted written statements during the comment period.

The hearings were conducted by Lawrence M. Jakub, Attorney in Charge, Office of General Counsel, U.S. Department of Agriculture. Hearing proceedings and written comments are contained in the "Middle Fork Judith and Big Snowies Wilderness Study Hearing Record." This publication is available for review at the Lewis and Clark National Forest Supervisor's Office in Great Falls and the Northern Region Office in Missoula. Copies of the hearing records are submitted to Congress along with the study report. Hearing proceedings and written comments are contained in the "Middle Fork Judith and Big Snowies Wilderness Study Hearing Record."

Summary of Public Comments

Of the 135 people who either submitted written statements or spoke at the public hearings:

- 19 were from business
- 19 were from organizations or user groups
- 1 was from local government
- 1 was from state agency
- 95 were from individuals

AND

- 72 were from the area of influence*
- 33 were from the rest of Montana
- 28 were from outside Montana
- 2 no address

*Cascade, Chouteau, Fergus, Goden Valley, Judith Basin, Lewis and Clark, Meagher, Musselshell, and Wheatland Counties.

**WILDERNESS CLASSIFICATION
MIDDLE FORK JUDITH**

Support wilderness classification:

L-1, L-2, L-4, L-6, L-9, L-10, L-11, L-12
L-13, L-14, L-15, L-16, L-24, L-40, L-41
L-42, L-43, L-45, L-46, L-48, L-50, L-61
L-62, L-64, L-65, L-67, L-68, L-73, L-75
L-76, L-79, L-84, L-85, L-86, L-87, L-88
L-89, L-90, GFH-7, GFH-9, and GFH-14

Reasons include:

- deserves wilderness classification
- well qualified for wilderness
- outstanding wilderness character
- high WARS rating (22 out of a possible 28 points)
- limited wilderness opportunity in eastern Montana
- need for wilderness recreation
- watershed protection
- wildlife protection; wilderness dependent wildlife species
- important elk habitat
- economically wilderness designation makes more sense
- extractive resource potential is minimal
- timber yields and mineral resources are an inadequate reason for the unsuitable designation
- timber is extremely limited and of poor quality
- development of the upper 1/3 of the study area will place increased off-road vehicle and other development pressure on the other 2/3 of the area
- off-road vehicles are a threat to the future of this area

Against wilderness classification:

L-3, L-5, L-7, L-8, L-17, L-18, L-19, L-20
L-21, L-22, L-23, L-26, L-27, L-28, L-29, L-31
L-32, L-33, L-37, L-39, L-49, L-52, L-53
L-54, L-55, L-56, L-57, L-58, L-63, L-66
L-69, L-70, L-71, L-72, L-74, L-77, L-78
L-83, L-91, L-92, GFH-2, GFH-3, GFH-4, GFH-5
GFH-6, GFH-8, GFH-10, GFH-13, GFH-15, GFH-16
GFH-17, GFH-23, GFH-27, LH-2, LH-4, LH-5, LH-12
LH-13, and LH-14

Reasons include:

- leave as is
- wilderness would curtail use of these lands
- wilderness would limit the access to the area
- wilderness would affect recreational opportunities, especially motorized use
- should be available for all uses
- outstanding mineral values, especially sapphires
- allow for energy and mineral exploration
- too much land being withdrawn from mineral entry
- does not qualify for wilderness; 64 miles of road and 154 acres of deeded land
- need progressive range management
- don't let timber die and rot
- maintain water, range and recreation resources, improve wildlife habitat, do not log
- close more roads
- less livestock grazing
- study area does not possess sufficient wildlife values
- retain commercial forest lands in timber base
- contains a significant volume of saw timber
- high demand for timber
- community stability
- timber can be harvested with a positive return to government
- support a little logging with road closures
- concern over additional roads and loss from fire
- little public support for wilderness

Response

The Middle Fork Judith contains 64 miles of road: 52 miles of primitive road and 12 miles of low standard road. Motorized recreation takes place throughout the area. Opportunities are available to maintain or improve spring/fall ranges for elk and mule deer. The area contains 460 million board feet of timber. Site productivity is average when compared to other sites on the Forest. The areas most suitable for timber management are in the upper basins of the Middle Fork and Lost Fork. There are approximately 150 prospects and mines within the study area. The famed yogo sapphire deposit lies partially in the study area. Evidence indicates that lead, silver, and molybdenite exist in quantity, but at long distances from milling sites. The Forest Service recommends nonwilderness for the Middle Fork Judith Study Area.

**WILDERNESS CLASSIFICATION
BIG SNOWIES**

Support wilderness classification:

L-1, L-2, L-4, L-6, L-9, L-10, L-11, L-12
L-13, L-14, L-15, L-16, L-40, L-41, L-42
L-43, L-45, L-46, L-48, L-50, L-61, L-64
L-65, L-66, L-67, L-68, L-69, L-73, L-75
L-76, L-77, L-79, L-81, L-84, L-85, L-86
L-87, L-88, L-89, L-90, GFH-9, GFH-14,
and GFH-21

Reasons include:

- deserves wilderness classification
- well qualified for wilderness
- outstanding wilderness character
- high WARS rating (24 out of a possible 28 points)
- limited wilderness opportunity in eastern Montana
- need for wilderness recreation
- watershed protection
- wildlife protection, wilderness dependent wildlife species
- vague ecosystems
- economically wilderness designation makes more sense
- extractive resource potential is minimal
- little mineral potential
- there will be more pressure to use the area for more off-road vehicle use and developed purposes
- off-road vehicles are a threat to the future of the area

Against wilderness classification:

L-3, L-5, L-7, L-8, L-18, L-19, L-29, L-30
L-34, L-36, L-39, L-52, L-53, L-54, L-55
L-56, L-57, L-58, L-63, L-70, L-72, L-74
L-78, L-91, L-92, GFH-2, GFH-3, GFH-4, GFH-8
GFH-10, GFH-15, GFH-17, LH-2, LH-3, LH-4, LH-8,
and LH-12

Reasons include:

- leave as is
- wilderness would curtail use of these lands, especially motorized recreation
- wilderness would limit the access to the area
- area does not possess sufficient wilderness values
- need progressive range management

- considerable hydrocarbon potential
- allow for energy and mineral development
- timber needs to be harvested
- don't let the timber die and rot
- contains a significant volume of sawtimber
- timber could be harvested with a positive return to government
- high demand for timber
- community stability
- little public support for wilderness

Response

The Big Snowies contain 50 miles of road: 14 miles of primitive road and 36 miles of low standard road. Almost every stream bottom on the periphery has a road which penetrates into the study area for varying distances. Motorized recreation takes places on these roads and some trails. Opportunities are available for habitat improvement to enhance spring/fall ranges for deer and elk. The area contains 317 million board feet of timber. Productivity is less than average for the Forest. Most of the commercial forest is in the canyon bottoms and western slopes. The lack of access into these areas is the greatest limitation to timber harvest. The past and present mineral activity for base and precious metals has been minimal. The southern half of the area has a potential for accumulation of oil and gas. The Forest Service recommends nonwilderness for the Big Snowies Study Area.

ALTERNATIVES

Several respondents favored a particular alternative.

Middle Fork Judith

Alternative 1 -- L-80 and GFH-21

Alternative 2 -- (Wilderness) L-4, L-15, L-16, L-42, L-61, L-62, L-64, L-73, L-80, L-84, L-86, L-87, L-89, L-90, and GFH-14

Alternative 3 -- L-3, L-5, L-7, L-8, L-55, GF-2, and LH-2

Alternative 5 -- L-74

Alternative 6 -- (Preferred) L-21, L-32, L-35, L-37, L-49, L-52, L-53, L-54, L-56, L-57, L-83, GFH-4, and GFH-6

Big Snowies

Alternative 1 -- (Preferred) L-32, L-52, L-53, L-54, L-56, and L-57

Alternative 2 -- (Wilderness) L-4, L-15, L-16, L-42, L-61, L-64, L-73, L-81, L-84, L-86, L-87, L-89, L-90, GFH-14, and GFH-21

Alternative 3 -- L-3, L-5, L-7, L-8, L-55, GFH-2, LH-2, and LH-8

Alternative 5 -- L-74

One respondent thought the Forest Service erred by not presenting various wilderness boundary alternatives to reduce resource conflicts (GFH-14).

Response

The Forest reviewed all alternatives in relation to the draft analysis and public comment. For the Middle Fork Judith a new preferred alternative (Alternative 7) was developed. This alternative reduced the area available for timber management from 24,200 to 11,600 acres. This was done to keep elk security and calving habitat in a roadless undeveloped condition and to keep a through road from developing. The Forest feels that even with high elk values and public concern to leave the area as it is, the timber management is appropriate and necessary in the Harrison and Weatherwax drainages. About 5,000 acres in this area has been identified as being highly susceptible to mountain pine beetle attacks.

For the Big Snowies no changes in the preferred alternative were made. The area will be managed for semi-primitive recreation and wildlife habitat.

The reasons for not adjusting boundaries and creating additional wilderness alternatives are discussed on page 2-12.

Other Management

Several respondents commented on other management for the study areas. While many respondents did not support wilderness classification, they wanted the Middle Fork Judith left as it is.

L-44, L-47, L-51, L-60, L-82, GFH-25, GFH-26 and LH-1

Many respondents were against harvesting timber in the Middle Fork Judith.

L-93, GFH-11, GFH-12, GFH-22, GFH-24, GFH-25, GFH-26, GFH-28, LH-1, LH-5, LH-6, LH-7, LH-9, and L-11

Or were against harvesting timber in either the Middle Fork Judith or Big Snowies.

L-38, L-44, and L-51

One respondent felt we could have both wilderness and economic development. GFH-18

One respondent felt resource development outweighed the cost of decreasing semi-primitive recreation opportunities. LH-2

Responses

The Forest Service has reviewed comments on the management of the study areas. No changes have been made in the Big Snowies. It will be managed for wildlife and semi-primitive recreation. In the Middle Fork of the Judith, the area to be managed for timber has been reduced from 24,200 to 11,600 acres. The remaining 80,400 acres will be managed for wildlife and semi-primitive recreation.

Judith Elk Herd

Several respondents emphasized the importance of the Judith elk herd.

GFH-1, GFH-9, GFH-11, GFH-12, GFH-16, GFH-22, GFH-23, LH-1, LH-4, LH-5, LH-6, LH-9, L-35, L-40, L-41, L-43, L-67, L-69, L-80, L-90, and L-93

Response

The Forest shares this concern. The proposed management for the Middle Fork Judith maintains over 85 percent of the study area in an undeveloped condition for elk security and calving habitat. While timber harvest is proposed on the other 15 percent of the study area, open road

densities will be controlled and security cover will be maintained. Research findings for the Montana Cooperative Elk-Logging Study will be used in timber sales and road construction projects.

Study Report

Some respondents felt the study report did not adequately consider:

- the beneficial effects of timber harvest on wildlife. L-55, GF-2, LH-2 and LH-12
- the influences of insect and fire. L-55, GF-2 and LH-2
- the wilderness resource. GFH-14
- the quality of recreation. GFH-14
- the timber resource. LH-2
- the decrease of elk population. GFH-14

Response

The alternative's effects on elk population and recreation quality is discussed in Chapter II. The wilderness resource and timber resource are described in Chapter III. The beneficial effect of timber harvest and influence of insects and fire are discussed in Chapter IV. All of these concerns were reviewed and some small additions or changes were made in the final report.

Legal Requirements

Some respondents felt, that because some of the Middle Fork Judith area was included in the suitable timber-producing land base (proposed Lewis and Clark Forest Plan), the study violates the MWSA. Two respondents felt that management plans should be curtailed until wilderness study process is complete. One respondent stated the Forest Service is required to protect National Forest land and that the management plan for the Big Snowies and Middle Fork Judith satisfies this requirement.

L-24, L-25, L-70, and GFH-14

Response

We believe the Forest is meeting the intent of the MWSA. If Congress should decide to classify the Middle Fork Judith as wilderness, the Forest Plan will be modified appropriately. Timber harvest will not be programmed from the areas nor will the potential volumes be included in the allowable sale quantity for the Forest until Congress has had an opportunity to act.

Until Congress determines otherwise, the wilderness study areas will be managed subject to existing private rights and uses, to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System.

Additional Needs

Some respondents wanted additional information.

- discussion of study methodology. GFH-14
- suitable timber lands. GFH-14
- alternative sources of timber. GFH-14
- acres by management emphasis. L-6

or changes in information

- Tables 2.1 and 2.6 provide no acres for range and wildlife. GFH-14
- PNW are highly suspect given the inflated timber values. GFH-14
- only 6 of the 19 issues are wilderness issues. GFH-14
- all of the costs will increase in real terms over time. GFH-14

Response

The National Environmental Policy Act, National Forest Management Act, and Wilderness Act all establish the study methodology. Chapter I discusses the process. It is not the intent of an EIS to describe the process, but rather to display the proposal, the alternatives, the effects and the consequences.

Suitable timber lands are shown in Chapter II.

Timber supply is discussed in Chapter III.

Acres by management emphasis are shown in Chapter II.

Allocation of acres to the wilderness emphasis (Table 2.1 and 2.3) contains all wilderness activities including wildlife and range management.

Timber values are based on stumpage values for 1971 to 1978. Based on sales sold in F.Y. 1983 on the Forest, the values are correct.

Issues for the MWSA area were determined from public workshops and written comments. (See page 1-2.) The issues for the Middle Fork Judith and Big Snowies appear to be appropriate.

Our economic analysis shows only timber will have a real price increase. Other resources will have only inflationary increases.

The tentative suitable timber producing land in the Middle Fork Judith was included in the proposed Forest Plan and alternative analysis. They will not be included in the final plan until Congress makes a decision on wilderness classification. The Forest Service feels that this complies with the MWSA.

The management plan for the Big Snowies and Middle Fork Judith is prepared under the National Forest Management Act. Fire protection and insect and disease control are a part of the consideration under this Act.

Other Needs

Some respondents wanted:

- assured access for oil and gas exploration. L-3, L-5, L-7 and L-8
- the Middle Fork Judith managed as a wildlife area. L-66, L-69 and GFH-16
- the Big Snowies retained in a semi-primitive condition with or without wilderness. L-35
- no additional grazing. L-44, L-47 and L-51
- more balanced multiple use. GFH-3
- more timber management. L-58
- the areas protected. L-59
- producing proportions maintained. GFH-4

Response

When viewed from a Forest wide perspective, the planned management provides a balanced approach to National Forest resource management.

The Forest Service feels other resource values preclude additional timber management and that the areas are protected and producing properites are maintained.

If the areas are allocated to non-wilderness, access for oil and gas will not be restricted. Appropriate access will be evaluated using environmental analysis procedures.

Over 85 percent of the Middle Fork Judith study area will be managed for wildlife and semi-primitive recreation. The other 15 percent will be managed for timber products. Measures to maintain wildlife values are included in the management of this area.

No additional grazing would be planned on big game winter range or riparian zones, unless wildlife needs could be fully met.

FEIS

GLOSSARY

A

- Access See Public Access.
- Acre-Equivalent (AE) A unit of habitat related to fish or wildlife habitat improvement projects. Acre equivalents are the acres of habitat that are influenced by an acre of that is actually modified by the project. For example, an acre of winter range burned is credited with influencing 4 acres of summer range.
- 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 Fuels Logging debris generated from any activity on the Forest, such as firewood gathering, precommercial thinning, timber harvesting, and road construction, which causes fire potential.
- 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 and the relationship of people to that environment that will or may be changed by proposed actions.
- Allocation The assignment of management prescriptions to particular land areas to achieve the goals and objectives of the alternatives.
- Allocation Model See Resource Allocation Model.
- Allotment See Range Allotment.
- Allowable Sale Quantity The quantity of timber that may be sold from the 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 mix of management prescriptions applied in specific amounts and locations of land, to achieve a desired management emphasis as expressed in the alternative's goals and objectives.

<u>Analysis Area</u>	Homogenous areas of land formed from data stored in the data base and criteria from the Inter-disciplinary Team.
<u>Analysis of the Management Situation</u>	A determination of the planning area's ability to supply goods and services in response to society's demand for those goods and services.
<u>Animal Unit Month (AUM)</u>	The quantity of forage required by one mature cow (1,000 lbs.) or the equivalent for one month.
<u>Arterial Roads</u>	Roads comprising the basic access network for National Forest System administrative and management activities. These roads ordinarily serve all resource elements, and maintenance is not normally determined by the activities of any one element. They provide service to large areas and usually connect with public highways or other Forest arterial roads, to form an integrated network of primary travel routes. The location and standard are determined often by a demand for maximum mobility and travel efficiency, rather than by a specific resource management service. Usually arterial roads are developed and operated for long-term land and resource management purposes and constant service.
<u>Available, Capable, and Suitable</u>	See Available Lands, Capable Lands, and Suitable Lands.
<u>Available Lands</u>	Land that has not been legislatively withdrawn or administratively withdrawn, by the Secretary of Agriculture or Forest Service Chief, from timber production.

B

<u>Backlog</u>	Any reforestation or site preparation needs created prior to July 1, 1975.
<u>Base Timber Harvest Schedule</u>	The timber harvest schedule in which the planned sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade. The planned sale and harvest for any decade is not greater than long-term sustained yield capacity.

Benchmark Levels

The outputs and costs for managing the Forest at certain levels. Benchmarks were developed so a comparison could be made on costs, values, and effects of the alternatives. Benchmark levels were developed for: minimum maintenance, maximum resource potentials, and maximum net present value.

Best Management Practices

A practice or combination of practices which is determined through a cooperative agreement between the State of Montana and the USDA-Forest Service after problem assessment, examination of alternative practices, and appropriate public participation to be the most effective, practicable (including technological, economic, and institutional considerations) means that prevents or reduces the amount of pollution generated by non-point sources to a level compatible with water quality goals (Federal Register Vol. 40, No. 230, November 28, 1975). BMPs also refer to a broader process of identifying practices and techniques that may be used to reduce water quality impacts. It is the latter concept that is used in summarizing state-of-the-art techniques and practices.

Big Game

Those species of large mammals normally managed as a sport hunting resource.

Big Game Winter Range

The area available to and used by big game through the winter season.

Blackfeet Treaty Rights Area

Those lands on the Rocky Mountain Division where the Blackfeet Indian Nation retained certain use rights under the Treaty of 1896.

Board Foot (Bd. Ft. or BF)

A unit of timber measurement equaling the amount of wood contained in an unfinished board 1 inch thick, 12 inches long, and 12 inches wide.

Board Foot/Cubic Foot Conversion Ratio

Both board foot and cubic foot volumes can be determined for timber stands. The number of board feet per cubic foot of volume varies with tree species, diameter, and height, and form factors. For the Lewis and Clark, the Forest-wide average conversion ratio is 3.4 board feet per cubic foot.

Browse

Twigs, leaves, and young shoots of trees and shrubs which animals eat; in particular, those shrubs which big game animals eat.

CCapability

The land's potential to produce resources, supply goods and services, and allow resource uses under an assumed 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.

Capable Lands

Those portions of the Forest that have an inherent ability to support trees for timber harvest and produce at least 20 cubic feet/acre/year of wood fiber.

Carrying Capacity

The number of organisms of a given species and quality that can survive in, without causing deterioration of, a given ecosystem through the least favorable environmental conditions that occur within a stated interval of time.

Catchable Trout

A trout over 6 inches long.

CEQ

See Council on Environmental Quality.

CFR

Code of Federal Regulations.

Classes I, II, III --
Air Quality Standards

This is a designation given geographic areas of the country having air pollutant concentrations less than national standards. Denotes the increment above which deterioration of air quality would be regarded as significant and consequently not allowed. Class I allows the least deterioration; class III, the most. See Clean Air Act (Public Law 88-206), section 163, for description of the specific increments.

Clearcutting

An even-aged silvicultural system in which the old crop is cleared over a considerable area at one time; regeneration is sometimes artificial, but usually it is natural regeneration from adjacent stands or from seed (including cone-bearing slash) and/or advance growth already on the ground.

Coefficients

These are the costs for producing various Forest resources (cost coefficients), the value of products or use (value coefficients), and the outputs from the Forest (yield coefficients).

Collector Roads

Roads constructed to serve two or more resource elements, but which do not fit into the other two categories (arterial or local). Construction are prorated to the respective element served. These roads serve small land areas and are usually connected to a Forest arterial or public highway.

They collect traffic from Forest local 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.

Commercial Forest Land (CFL)

Forest land which is producing or is capable of producing crops of industrial wood and which has not been reserved or deferred. This includes areas suitable for management to grow crops of industrial wood generally of a site quality capable of producing in excess of 20 cubic feet/acre/year of wood fiber. This includes both accessible and inaccessible areas. Permanently inoperable or nonstockable areas are excluded because they are not suitable for silvicultural management. Conversely, nonstocked areas which are stockable and otherwise meet this definition are included.

Commodity Outputs

A resource output with commercial value; all resource products which are articles of commerce.

Concern

See Management Concern.

Condition Class

Description of the existing tree vegetation as it relates to size, stocking density, and age.

Constraint

An absolute limit that restricts alternatives.

Consumptive Use

Those uses of a resource that reduce the supply. For example, some consumptive uses of water are: irrigation, domestic, and industrial use.

Continental Divide

The drainage divide that locally separates the Mississippi and Columbia River basins.

Corridor

A narrow 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 facilities.

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 specified levels in the least cost manner. Cost

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.

Cubic Feet

The amount of timber equivalent to a piece of wood 1 foot by 1 foot by 1 foot.

Culmination of Mean Annual Increment

See Mean Annual Increment.

Cultural Resources

The physical remains (artifacts, ruins, burial mounds, petroglyphs) and conceptual content or context (as a setting for legendary, historic, or prehistoric events, as a sacred area of native peoples) of an area which is useful or important for making land use planning decisions.

D

Data Base

A computerized data storage and retrieval system.

Departure

In order to meet overall multiple use objectives, the Secretary of Agriculture may establish an allowable sale quantity for any decade which departs from the projected long-term average sale quantity.

Dependent Communities

Communities whose social, economic, or political life would become discernably different in important respects if market or non-market outputs from the National Forests were cut off.

Developed Recreation

The type of recreation that occurs where modifications (improvements) enhance recreation opportunities and accommodate intensive recreation activities in a defined area.

<u>Developed Recreation Site</u>	Relatively small area where facilities are provided for concentrated public use (campgrounds, picnic areas, swimming areas, and ski areas).
<u>Diameter Breast Height (d.b.h.)</u>	Diameter of a tree 4½ feet above the ground.
<u>Dispersed Recreation</u>	Recreation use that requires few, if any, improvements and may occur over a wide area. Involves activities related to roads and trails. The activities do not necessarily take place on or adjacent to a road or trail--only in conjunction with it. Activities tend to be day-use oriented and include hunting, fishing, berry picking, off-road vehicle use, hiking, horseback riding, picnicking, camping, viewing scenery, snowmobiling, and many others.
<u>District Ranger</u>	The official responsible for administering the National Forest System Lands on a Ranger District.
<u>Diversity</u>	The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan.
<u>Dry Forest</u>	Commercial Forest land that usually receives less than 25 inches of precipitation per year. Includes the following habitat series: limber pine, ponderosa pine, Douglas fir/bluebunch wheatgrass, Douglas fir/white spirea, Douglas fir/nine bark, and subalpine fir/virgin's bower. The dry forest produces from 20 to 49 cubic feet/acre/year of wood fiber.

E

<u>Early Forest Succession</u>	The biotic community that develops immediately following the removal or destruction of the vegetation in an area.
<u>Effective Buying Income</u>	That portion of income left after taxes, housing, food, and clothing have been paid for.
<u>Effects</u>	Results expected to be achieved or actually achieved related to physical, biological, and social (cultural and economic) factors resulting from the achievement of outputs. Examples of effects are tons of sediment, pounds of forage, person-years of employment, and income. There

	are direct effects, indirect effects, and cumulative effects.
<u>Endangered Species</u>	Plant or animal species identified by the Secretary of Interior as endangered in accordance with the 1973 Endangered Species Act.
<u>Ending Inventory Constraint</u>	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 regulated, managed forest.
<u>Environmental Analysis</u>	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.
<u>Environmental Assessment (EA)</u>	The concise public document required by the regulations to satisfy the procedural requirements of NEPA.
<u>Even-Aged Silviculture</u>	The application of a combination of actions that results 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 stands of varying ages (and, therefore, tree sizes) throughout the forest area. The difference in age between trees forming the main canopy level of stand usually does not 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. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands.
<u>Extensive Timber Management</u>	The practice of forestry on a basis of low operating and investment costs per acre.

F

<u>Facility Condition Class</u>	The rating system used in the Recreation Information Management System to classify the condition and maintenance needs of recreation sites and areas.
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<u>Fee Site</u>	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 2330.
<u>Final Cut</u>	See Overwood Removal.
<u>Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA)</u>	An act of Congress requiring the preparation of a program for the management of the National Forest's renewable resources and of land and resource management plans for units of the National Forest System. It also requires a continuing inventory of all National Forest System lands and renewable resources.
<u>Forest Supervisor</u>	The official responsible for administering the National Forest System lands in a Forest Service Administrative unit, which may consist of two or more National Forests or all the Forests within a state.
<u>Forest System Roads</u>	Roads that are part of the Forest development transportation system, which includes all existing and planned roads, as well as other special and terminal facilities designated as Forest development transportation facilities.
<u>FORPLAN</u>	A computer system used as a resource allocation model for developing and analyzing Forest planning alternatives.
<u>Forest Wide Management Guideline</u>	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.
<u>Fuel Management</u>	The practice of planning and executing treatment or control of any vegetative material which adversely affects meeting fire management direction based upon resource management goals and objectives.
<u>Fuels</u>	Wildland vegetative materials which can burn. While usually referring to above ground, living and dead wildland surface vegetation, roots and organic soils such as peat are often included.

GGame Species

Any species of wildlife or fish for which seasons and bag limits have been prescribed. These species are normally harvested by hunters, trappers, and fishermen, under State or Federal laws, codes, and regulations.

General Forest (GF)

Commercial forest land that usually receives more than 25 inches of precipitation per year. Includes the following habitat types: Douglas fir/pinegrass, subalpine fir/twinflower, subalpine fir/blue huckleberry, subalpine fir/grouse whortleberry, subalpine fir/sweetscented bedstraw, subalpine fir/menziesia, and subalpine fir/pinegrass. The general forest is further subdivided into (1) high productivity (from 50 to 84 cubic feet/acre/year of wood fiber) and (2) low productivity (from 20 to 49 cubic feet/acre/year of wood fiber).

Goals

A concise statement that describes a desired future condition. 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 produced by forest and range-land renewable resources. The tangible outputs are expressed in market and nonmarket terms.

Gravity Surveys

Gravity surveys generally involve vehicle supported operations in which gravity-density variations are measured by surface instruments. These surveys are usually limited to roads and gentle terrain.

Group Selection

A modification of the selection harvest system in which trees are removed in small groups at a time.

Guideline

An indication or outline of policy or conduct.

HHabitat Type

An aggregation of all land areas potentially capable of producing similar plant communities at climax.

Hiding Cover Vegetation capable of essentially hiding an adult elk from view at a distance equal to or less than 200 feet.

Horizontal Demand The assumption that, under pure competition, the Forest can sell as much timber as it wishes without

I

Indicator Species A species selected because its population changes indicate effects of management activities on the plant and animal community. A species whose condition can be used to assess the impacts of management actions on a particular area.

Indirect Effects Effects caused by the action but which are later in time or farther removed in distance, but still reasonably foreseeable.

Integrated Pest Management A process for selecting strategies to regulate forest pests in which all aspects of a pest-host system are studied. The information considered in selecting appropriate strategies includes (1) the impact of the unregulated pest population on various resources values, (2) alternative regulatory tactics and strategies, and (3) 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 not grazed during the growing season.

Intensive Timber Management The practice of forestry so as to obtain a high level of volume and quality of output per unit of land, through applying the best techniques of silviculture and management.

Intermittent Streams A stream which flows only when it receives water from springs or from some surface source, such as melting snow in mountainous areas.

<u>Interpretive Services</u>	Visitor information services designed to present inspirational, educational, and recreational values to Forest visitors to provide the utmost in understanding, appreciation, and enjoyment from their Forest experience.
<u>Inventory Data</u>	That information on Forest resources, such as soil, water, timber, wildlife, range, geology, minerals, and recreation, that was used to determine the capability and opportunity of the Forest.
<u>Issue</u>	See Public Issue.

L

<u>Land Base</u>	Net Forest acres.
<u>Land Exchange</u>	The conveyance of non-Federal land or interests to the United States in exchange for National Forest System land or interests in land.
<u>Land Line Location</u>	Legal identification and accurate location of National Forest property boundaries.
<u>Land Type</u>	An area of land classified on the basis of geomorphic principles. Geologic processes (as reflected in land surface form and features), individual kinds of soil, and the factors which determine the behavior of ecosystems (i.e. climate, vegetation, relief, parent materials, and time) are used as the basis of this classification system.
<u>Late Forest Succession</u>	A stage of forest succession where the majority of trees are mature or overmature.
<u>Leasable Minerals</u>	See Minerals, Leasable.
<u>Level I Fire Analysis</u>	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.
<u>Level II Fire Analysis</u>	An analytical process which guides the implementation of fire management activities of the Forest Plan.

Linear Programming

A mathematical method used to determine the most effective allocation 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., $y=a+bx$).

Local Roads

Roads constructed and maintained for, and frequented by, the activities of a given resource element. Some use may be made by other element activities, but normally maintenance 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. 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.

Locatable Minerals

See Minerals, Locatable.

Long-Term Sustained
Yield Capacity (LTSYC)

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.

MManagement Action

Any activity undertaken as part of the administration of the Forest.

Management Area

An aggregation of capability areas having common management direction. These areas may be non-contiguous and are used to allocate and schedule management practices.

Management Concern

An issue, problem, or 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 management prescriptions, and the associated standards and guidelines for attaining them.

<u>Management Intensity</u>	A management practice or combination of management practices and associated costs designed to obtain different levels of goods and services.
<u>Management Opportunity</u>	A statement of general actions, measures, or treatments that favorably addresses a public issue or
<u>Management Prescription</u>	Management practices and intensity selected and scheduled for application in a specific area to attain multiple use and other goals and objectives.
<u>Management Standards and Guidelines</u>	See Standard and Guideline.
<u>Maximum Resource Potential</u>	The maximum possible output of a given resource limited only by its inherent physical and biological characteristics.
<u>Mean Annual Increment</u>	The total volume up to a given age divided by that age, i.e., total volume divided by corresponding age. Culmination of mean annual increment occurs when the greatest mean annual increment is reached.
<u>Mineral Development</u>	The preparation of a proven deposit for mining.
<u>Mineral Entry</u>	The filing of a mining claim for public land to obtain the right to any minerals it may contain.
<u>Mineral Entry Withdrawal</u>	The exclusion of the right of possession of locatable mineral deposits by the locator on areas required for administrative sites by the Forest Service and other areas highly valued by the public. Public lands are withdrawn from entry under the General Mining Laws and/or the mineral leasing laws.
<u>Mineral Exploration</u>	The search for valuable minerals on lands open to mineral entry.
<u>Mineral Production</u>	Extraction of mineral deposits.
<u>Minerals, Leasable</u>	Coal, oil, gas, phosphate, sodium, potassium, oil shale, sulphur (in Louisiana and New Mexico), and geothermal steam.
<u>Minerals, Locatable</u>	Those hardrock minerals which are mined and processed for the recovery of the minerals; often metallic. May include certain nonmetallic minerals and uncommon varieties of mineral materials, such as valuable and distinctive deposits of limestone and

silica. May include any solid, natural inorganic substance occurring in the crust of the earth, except for the common varieties of mineral materials and leasable minerals.

Mining Claims

That portion of the public estate held for mining purposes in which the right of exclusive possession

Mitigate

To lessen the severity.

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.

Montana Wilderness Study Act Areas (MWSA)

Those areas (Middle Fork Judith and Big Snowies) that are required to be studied for their wilderness suitability under the Montana Wilderness Study Act of 1978 (Public Law 95-1950).

Multiple Use

The management of all the various renewable surface resources of the National Forests 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 resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration given to the relative values of the various resources, and not necessarily the combination of the uses that will give the greatest dollar return, or the greatest unit output.

N

National Environmental Policy Act (NEPA)

An act to declare a National policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.

National Forest
Landscape Management
System

A system of planning and administering the use of forest lands so that the visual effects maintain or upgrade man's psychological welfare. It is the planning and design of the visual aspects of multiple use land management.

National Forest
System Land

National Forests, National Grasslands, and other related lands for which the Forest Service is assigned administrative responsibility.

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, which are reasonably accessible to urban areas.

National Wilderness
Preservation System

All lands covered by the Wilderness Act and subsequent wilderness designations, irrespective of the department or agency having jurisdiction.

Natural Fuels

Fuels not directly generated or altered by management activity.

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 or not they can be quantitatively valued. 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 most likely future condition if the current plan would continue unchanged.

Noncommodity Outputs

A resource output that cannot be bought and sold.

Nonconsumptive Use

Those uses of resources that do not reduce the supply. For example: Nonconsumptive uses of water include hydroelectric power generation, boating, swimming, etc.

<u>Nondeclining Yield (NDY)</u>	A level of timber production planned so that the planned sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade.
<u>Nongame</u>	Species of animals which are not managed as a sport
<u>No-Surface Occupancy Stipulation</u>	A mineral lease clause that permits passive activities, such as seismic exploration or directional drilling from adjacent areas, but prohibits the occupancy of the surface with roads or drilling equipment.

O.

<u>Objective</u>	A concise, time-specific statement of measurable planned results that respond to pre-established 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.
<u>Off-Road Vehicle (ORV)</u>	Any vehicle capable of being operated off an established road or trail.
<u>Old-Growth</u>	A stand of trees that is past full maturity and showing decadence; the last stage in forest succession.
<u>Operations Plan</u>	A written plan, approved by a Forest Officer, prepared by those engaged in mining activity on the Forest prospecting, exploration, describing mining and mineral processing activities that will likely cause a significant disturbance of surface requirements.
<u>Outputs</u>	The goods, services, products, and concerns which are measurable and capable of being used to determine the effectiveness of programs and activities in meeting objectives. Also goods, end products, or services that are purchased, consumed, or used directly by people. A broad term for describing any result, product, or service that a process or activity actually produces.
<u>Overmature Timber</u>	Trees that have attained full development, particularly in height, and are declining in vigor, health, and soundness.

<u>Overstory</u>	That portion of the forest forming the upper or uppermost canopy.
<u>Overwood Removal</u>	Removal of the last seed bearers or shelter trees after regeneration is considered to be established under a shelterwood system. This removal is also

P

<u>Particulates</u>	Small particles suspended in the air and generally considered pollutants.
<u>Patented Mining Claims</u>	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 or implementing regulations.
<u>Permit Grazing</u>	Use of a National Forest range allotment under the terms of a grazing permit.
<u>Planned Ignitions</u>	A fire started by a deliberate management action.
<u>Planning Area</u>	The area covered by a Regional or Forest Plan.
<u>Planning Criteria</u>	Standards, tests, rules, and guidelines by which the planning process is conducted and upon which judgments and decisions are based.
<u>Planning Period</u>	The 50-year time frame (1980-2030) for which goods, services, and effects were projected in the development of the Forest Plan.
<u>Planning Records</u>	The documents that record decisions and activities that result from developing a Forest Plan and its revisions.
<u>Pole</u>	Trees from 5.0 to 6.9 inch d.b.h.
<u>Policy</u>	A guiding principle upon which is based a specific decision or set of decisions.
<u>Practice</u>	See Management Practice.

Precommercial Thinning

The selective felling, deadening, or removal of trees in a young stand, primarily to accelerate diameter, on the remaining stems, maintain a specific stocking or stand density range, and improve the vigor and quality of the trees that remain. This practice is also important for lowering stand susceptibility to mountain pine beetle.

Present Net Value (PNV)

The difference between the discounted value (benefits) of all outputs, to which monetary values or established market prices are assigned, and the total discounted costs of managing the planning area.

Prescribed Fire

A wildland fire burning under specified conditions which will accomplish certain planned objectives. The fire may result from either planned or unplanned ignitions. Plans for prescribed fire with unplanned ignitions must be approved by the Regional Forester.

Prescription

See Management Prescription.

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.

Primitive
Recreation Setting

A classification of the recreation opportunity spectrum that is characterized by essentially unmodified natural environment of at least 5,000 acres. Interaction between users is very low and evidence of other area users is minimal. The area is managed to be essentially free from evidence of man-induced restrictions and controls. Motorized use within the area is not permitted.

Production Potential

The capability of the land or water to produce life-sustaining features (forage, cover, aquatics).

Productivity

See Site Productivity.

Program Planning
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 is the subject of an environmental analysis.

<u>Public Access</u>	Usually refers to a road or trail route over which a public agency claims a right-of-way available for public use.
<u>Public Issue</u>	A subject or question of widespread public interest relating to management of National Forest System lands. Public issues are identified through public participation.

R

<u>Range Allotment</u>	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.
<u>Range Condition</u>	The state of health of the range based on what it is naturally capable of producing.
<u>Ranger District</u>	Administrative subdivisions of the Forest supervised by a District Ranger who reports to the Forest Supervisor.
<u>RARE II</u>	See Roadless Area Review and Evaluation II.
<u>Research Natural Area</u>	An area in as near condition as possible, which exemplifies typical or unique vegetation and associated biotic, soil, geologic, and aquatic 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.
<u>Record of Decision</u>	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.
<u>Recreation Capacity</u>	The number of people that can take advantage of the supply of recreation opportunity without substantially diminishing the quality of the experience sought after.
<u>Recreation Residence</u>	Houses or cabins on National Forest land that are not the primary residence of the owner.

Recreation Opportunity Spectrum (ROS)

A system for planning and managing recreation resources that recognizes recreation activity opportunity, recreation setting opportunity, and recreation experience opportunity along a spectrum or continuum.

Red Belt

The name "red belt" is applied to winter drying that occurs in zones, or belts, more or less following contour lines. Red belt occurs during midwinter or early spring, often a period of cold weather. Sudden large increases in temperature, often accompanied by drying winds (chinooks), cause excessive loss of water from the needles. This moisture loss cannot be replaced because the soil moisture is either frozen or too cold, is not available from the roots, or because the wood in the stem is frozen and water cannot pass through it. The disease manifests itself by browning of the needles in the spring.

Reforestation

The re-establishment of a tree crop on forest land.

Regeneration

The renewal of a tree crop, whether by natural or artificial means.

Regeneration Cutting

Any removal of trees intended to assist regeneration already present or to make regeneration possible.

Regional Forester

The official responsible for administering a single 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 will be regulated to achieve several long range objectives, such as maintaining setting for recreational activities, rotating forage production areas and wildlife habitat, increasing water yield, and increasing the growth and use of timber for the Nation's supply.

Regulations

36 CFR refers to the Code of Federal Regulations for implementing the National Forest Management Act.

Resource Allocation Model

A computer model using linear programming which will allocate land to prescriptions and schedule implementation of those prescriptions simultaneously. The end purpose of the model is to find a schedule and allocation that meets the goals of the Forest and optimizes some objective function, such as maxi-

	mization of present net value.
<u>Right-of-Way</u>	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.
<u>Riparian Zones</u>	Geographically delineated areas, with distinctive resource values and characteristics, that are comprised of the aquatic and riparian ecosystems, floodplains, and wetlands. They include all areas within a horizontal distance of approximately 100 feet from the edge of perennial streams or other water bodies.
<u>Roadless Area Review and Evaluation (RARE) II</u>	The assessment of "primitive" areas within the National Forests as potential wilderness areas as required by the Wilderness Act. This refers to the second such assessment which was documented in the final environmental impact statement of the Roadless Area Review and Evaluation, January 1979.
<u>Road Management</u>	The administrative decisions on the location and timing of road and trail closures.
<u>Roaded Natural Recreation Setting</u>	A classification of the recreation opportunity spectrum where the area is characterized by predominantly natural appearing environments with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.
<u>Rotation</u>	The planned number of years between the formation or regeneration of a crop or stand and its final cutting at a specified stage of maturity.
<u>RPA</u>	See Forest and Rangeland Renewable Resources Planning Act.
<u>RPA Program</u>	The recommended direction for long-range management of renewable resources of National Forest System lands. This direction serves as the basis for the Regional targets assigned to the Forest. The development of this direction is required by the Forest and Rangeland Renewable Resources Planning Act.

Rural Recreation Setting

A classification of 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.

S

Salvage Cutting

The exploitation of trees that are dead, dying, or deteriorating (e.g. because overmature or materially damaged by fire, wind, insects, fungi, or other injurious agencies) before their timber becomes worthless.

Sanitation Cutting

The removal of dead, damaged, or susceptible trees, essentially to prevent the spread of pests or pathogens and so promote forest hygiene.

Sawtimber

Trees suitable in size and quality that can be processed into lumber. For planning purposes on the Forest, trees with a 7-inch d.b.h. larger were classified as sawtimber.

Scenic Easement

An 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

The public and management activities used to determine the range of actions, alternatives, and impacts to be considered in an environmental impact statement.

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 Cutting

Removal of trees in a mature stand so as to affect permanent opening of its canopy (if there is no preparatory cutting to do this) and so provide conditions for securing regeneration from the seed of trees retained for that purpose; the first of the shelterwood cuttings under a shelterwood system.

Seedling/Sapling

A forest successional stage in which trees less than 5 inches in diameter are the predominant vegetation. Seedlings are 0-0.9 inch d.b.h., saplings are 1-4.9 inch d.b.h.

Seismic Methods

Seismic exploration is used to map underground geological features, to obtain more reliable information on the earth's subsurface, and to locate areas where accumulations of oil and gas might occur.

Seismic 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 such as faults, anticlines, and folds can be determined.

Portable

Where access limitations, topography, or other restraints prevent use of trucks, portable operations can be performed. Two portable techniques exist for collecting data.

- (1) Surface charge programs involve the detonation of a series of as much as 50 to 100 pounds of explosives at shot points 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 the Forest.

Conventional

The conventional method of collecting seismic data includes the use of truck mounted drills and vehicle-supported crews which generally involves off-road vehicle travel. This technique involves drilling 5 to 18 (generally 6) 5-inch diameter holes per mile to a depth of 180 to 200 feet. At this depth a 10 to 100 (generally 25 to 50) pound charge of explosive 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 four 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 (particularly the mature), individually or in small groups, from an uneven-aged forest to realize the yield and establish a new crop of irregular structure.

Semi-Primitive Recreation Setting

A classification of recreation opportunity spectrum that characterizes a predominantly 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 on-site controls and restrictions may be present, but are subtle. Motorized use may or may not be present, depending on the travel plan for the area.

Shelterwood

Even-aged silvicultural systems in which, in order to provide a source of seed and/or protection for regeneration, the old crop (the shelterwood) is removed in two or more successive shelterwood cuttings, the first of which is ordinarily the seed cutting (though it may be preceded by a preparatory cutting) and the last is the final cutting. Any intervening cuttings is called removal cuttings. NOTE: Removing the old crop in two successive cuttings, generally a regeneration cut and an overwood removal, is termed a two-step shelterwood. Removing the crop in three successive cuts, generally a preparatory cut, regeneration cut, and an overwood removal, is termed a three-step shelterwood.

Silvicultural Systems

A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. 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 thereby produced.

Site Preparation

A general term for removing unwanted vegetation, slash, and even roots and stones from a site before reforestation.

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.

Small Game

Birds and small mammals normally hunted or trapped.

Snag

Standing dead tree larger than 6 inches d.b.h. and greater than 20 feet in height.

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.

Spacial Fitting

The mapping of alternative allocation to make sure adjacent management emphases are compatible.

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.

<u>Stagnation</u>	A condition where plant growth is markedly reduced or even arrested through competition, state of the soil, or disease.
<u>Standard</u>	A principle requiring a specific level of attainment, a rule to measure against.
<u>Stipulations</u>	The requirements or clauses of a mineral lease.
<u>Subdivisions</u>	Areas of previously undeveloped land divided into individual homesites and/or blocks of lots with streets or roads and open spaces.
<u>Successional Stage</u>	A phase in the gradual supplanting of one community of plants by another.
<u>Suitability</u>	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.
<u>Suitable (Technically) Land</u>	Technology is available that will ensure timber production from the land without irreversible resource damage to soils, productivity, or watershed conditions. There is reasonable assurance that such lands can be adequately restocked as provided in CFR 219.13(h)(3).
<u>Suppression</u>	All the work of extinguishing or confining a fire, beginning with its discovery.

T

<u>Targets</u>	A quantifiable output.
<u>Thinning</u>	A felling made in an immature crop or stand primarily to accelerate diameter growth but also, by suitable selection, to improve the average form of the trees that remain, without permanently breaking the canopy.
<u>Threatened Species</u>	Those plant or animal species identified by the Secretary of Interior as threatened in accordance with the 1973 Endangered Species Act.

<u>Tiering</u>	Refers to the coverage of general matters in broader environmental impact statements (such as national program or policy statements) with subsequent narrower statements or environmental analyses (such as regional or basinwide program statements or ultimately site-specific statements) incorporating by reference the general discussions and concentrating solely on the issues specific to the statement subsequently prepared.
<u>Timber</u>	A general term for the major woody growth of vegetation in a forest area.
<u>Timber Base</u>	The lands within the Forest capable, available, and suitable for timber production.
<u>Timber Harvest Schedule</u>	The quantity of timber planned for sale and harvest, by time period, from the land covered by the Forest Plan. The first period, usually a decade, of the selected harvest schedule provides the allowable sale quantity. Future periods are shown to establish that sustained yield will be achieved and maintained.
<u>Timber Production</u>	The growing, tending, harvesting, and regeneration of regulated crops of industrial wood. Industrial wood includes logs, bolts, or other round sections cut from trees for industrial or consumer use, except fuelwood.
<u>Timber Stand Improvements</u>	A loose term comprising all intermediate cuttings made to improve the composition, structure condition, and quality of a timber stand.
<u>Trailheads</u>	The parking, signing, and other facilities available at the terminus of a trail.
<u>Transitory Range</u>	Land that is suitable for grazing use of a nonenduring or temporary nature over 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.
<u>Tree Opening</u>	An opening in the forest cover created by even-aged silvicultural practices.
<u>Trespass</u>	The act of unlawfully going on another's land or property.

UUnderstory

The trees and other woody plants growing 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 Silviculture

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.

Unplanned Ignition

A fire started at random by either natural or human causes, or a deliberate incendiary.

Utilization Standards

Standards guiding the use and removal of timber. They are measured in terms of minimum diameters, minimum lengths, and percent "soundness" of the wood.

VVegetation Treatment

Any activities undertaken to modify the existing condition of the vegetation.

Viable Populations

A wildlife or fish population of sufficient size to maintain its existence over time, in spite of normal fluctuations in population levels.

Visual Quality
Objective (VQO)

A desired degree of acceptable alteration of the landscape based on physical and sociological characteristics of an area. For this plan, these degrees of alteration are classified by preservation, retention, partial retention, and modification.

Preservation

Management activities, except for very low visual-impact recreation facilities, are prohibited. Only ecological changes are allowed.

Retention

Activities must not be visually evident and may only repeat form, line, color, and texture which are frequently found in the characteristic landscape. Changes in the qualities of size, amount, intensity, direction, and land pattern should not be evident.

Duration of Visual Impact: Immediate reduction in form, line, color, and texture contrast. Retention should be accomplished either during operation or immediately after. It may be done by such means as seeding vegetative clearings and cut-or-fill slopes, hand planting of large stock, and painting structures.

Partial Retention

Activities remain visually subordinate to the characteristic landscape and may repeat form, line, color, or texture common to the landscape. However, changes in the qualities of size, amount, intensity, direction, and pattern remain visually subordinate to the characteristic landscape.

Duration of Visual Impact: Reduction in form, line, color, and texture should be accomplished as soon after project completion as possible or at a minimum within the first year.

Modification

Activities may visually dominate the original characteristic landscape. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Additional parts of these activities, such as structures, roads, slash, and root wads, must remain visually subordinate until they are compatible with the natural surroundings.

Duration of Visual Impact: Reduction in form, line, color, and texture should be accomplished in the first year or at a minimum should meet existing regional guidelines.

Visual Resource

The composite of basic terrain, geologic features, water features, vegetative patterns, and land uses that typify a land unit and influence the visual appeal the unit may have for visitors.

W

Water Yield

The measured output of the Forest's streams.

Wetlands

Areas that are inundated by surface or ground water with the frequency sufficient to support and under normal circumstances does or would support a prevalence of riparian vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, overflows, and mudflats.

Wilderness

Under the 1964 Wilderness Act, wilderness is undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation. It is protected and managed so as to preserve its natural conditions which 1) generally appear to have been affected primarily by the 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.

Wildfire

Any wildland fire that requires a suppression response.

Withdrawal

An order removing specific land areas from availability for certain uses.

Work Year Equivalents

Approximately 2,000 working hours. May be filled by one person working yearlong or several people filling seasonal positions.

FEIS

MONTANA WILDERNESS
STUDY ACT AREAS

APPENDICES

APPENDIX A

PLANNING RECORDS

A-1

APPENDIX B

LIST OF RESPONDENTS

B-1

APPENDIX A

FEIS MONTANA WILDERNESS STUDY ACT AREAS

PLANNING RECORDS

Appendix A lists those planning records that are referenced in the FEIS that are available on request. These records and other planning documents are available for review during normal business hours (8:30 am to 4:30 pm, weekdays, except holidays) at the Supervisor's Office in Great Falls, Montana. Requests for copies of available planning records should be sent to:

Lewis and Clark National Forest
P.O. Box 871
Great Falls, Montana 59403

1. "Lewis and Clark National Forest Work Plan," Lewis and Clark National Forest, November 1978.
2. "Data Base Components," Lewis and Clark National Forest, November 1979.
3. "Social Impact Assessment Baseline, 1980," Lewis and Clark National Forest, December 1980.
4. "Alternatives from Public Involvement," Lewis and Clark National Forest, March 1981.
5. "Analysis Areas," Lewis and Clark National Forest, April 1981.
6. "Proposed Criteria and Documentation," Lewis and Clark National Forest, August 1981.
7. "Analysis of the Management Situation," Lewis and Clark National Forest, August 1981.
8. "Alternatives," Lewis and Clark National Forest, August 1981.
9. "Management Guideline Analysis Report," Lewis and Clark National Forest, August 1981.
10. "Identification of Public Issues and Management Concerns," Lewis and Clark National Forest, January 1982.
11. "Economic Data and Analysis," Lewis and Clark National Forest, January 1982.
12. "Yield Coefficients," Lewis and Clark National Forest, January 1982.
13. "Management Prescriptions," Lewis and Clark National Forest, January 1982.
14. "Lewis and Clark FORPLAN Model," Lewis and Clark National Forest, January 1982.
15. "Management Practices," Lewis and Clark National Forest, January 1982.
16. "Input/Output Model," Lewis and Clark National Forest, January 1982.
17. "MWSA Workshop Analysis Summary," Northern Region, 1979.
18. "Level I Fire Management Analysis" and "Addendum," Lewis and Clark National Forest, March 1980 and February 1981, respectively.
19. "Insect and Disease Considerations for the Forest Plan," Lewis and Clark National Forest, January 1983.

APPENDIX B

**MONTANA WILDERNESS
STUDY ACT AREAS**

LIST OF RESPONDENTS

Appendix B lists those people and organizations who spoke at the hearings or submitted written comments on the Draft Study Report.

LIST OF HEARING SPEAKERS - GREAT FALLS

MWSA Hearings - December 7, 1982

Great Falls

SPEAKERS

- GFH-1 Nels Thoreson, Montana Dept Fish Wildlife & Parks, Great Falls, MT
- GFH-2 Ron McCormick, Timber Manager, Castle Mountain Corporation, Box J, White Sulphur Springs, MT 59645
- GFH-3 James E. Bentley, Forest Lands Manager, Champion International Corporation, Box 8, Milltown, MT 59851
- GFH-4 Harry C. Bullock, Chairman, Bullock Exp Inc., 3025 Parker Road, Suite 209, Aurora, CO 80014
- GFH-5 Dennis K. Brown, Intergem, 3025 Parker Road, Suite 209, Aurora, CO 80014
- GFH-6 Delmer Brown, President, International Geoscience, 1095 Dudley St, Lakewood, CO 80215
- GFH-7 Phil Korell, Homestake Ranch, Highwood Rt 1, Great Falls, MT 59401
- GFH-8 Don Allen, RMOGA, Box 786, Helena, MT 59601
- GFH-9 Steve Moltzan, Trapper & Hunter, 1013 1st Ave So., Great Falls, MT
- GFH-10 Al Kington, WETA, Helena, MT
- GFH-11 HA (Harley) Jordan, West of Great Falls, MT
- GFH-12 Tom O'Connor, Sportsman, Donovan Park, Great Falls, MT
- GFH-13 Bill Eusterman, permittee, 2825 1st Ave North, Great Falls, MT
- GFH-14 Bill Cunningham, Wilderness Society, Box 1184, Helena, MT 59601
- GFH-15 George Roskie, retired US Forest Service, 3440-6th Ave So., Great Falls, Mt
- GFH-16 George Engler, retired US Forest Service, 2412-5th Ave So., Great Falls, MT
- GFH-17 Ken Hoovestal, snowmobilers, 505-33rd St. North, Great Falls, MT
- GFH-18 John Owens, Choteau, MT
- GFH-19 Emal Hanson, farmer, Great Falls, MT
- GFH-20 John Kranich, 116 Riverview C, Great Falls, MT
- GFH-21 Terry Albrecht, 4817 Ella Avenue, Great Falls, MT

GFH-22 Ervin Moltzan, hunter, 1504-4th Ave. So., Great Falls, MT

GFH-23 Dale Pugh, West of Great Falls, MT

GFH-24 Dana Woodward, Box 4 Moroney Rt, Great Falls, MT

GFH-25 Jack Entner, 2100-2nd Ave So., Great Falls, MT

GFH-26 John Major, Jr., Box 1313 Route 1 West, Great Falls, MT

GFH-27 Rich Motil, President Montana Snowmobile Association, Box 6015,
Great Falls, MT

GFH-28 George Eusterman, 2825-1st Ave. North, Great Falls, MT

LIST OF HEARING SPEAKERS - LEWISTOWN
MWSA Hearings - December 8, 1982

Lewistown

SPEAKERS

- LH-1 Otto Jensen, County Commissioner, Fergus County, Lewistown, MT
- LH-2 Ed Regan, Spring Creek Forest Products, Judith Gap, MT 59453
- LH-3 W. H. Broman, General Manager, Rocky Mountain Division, Shell Oil, Houston, TX
- LH-4 Terry Claver, Self, Box 442, Stanford, MT 59479
- LH-5 Merritt Pride, Outfitter, Stanford, MT
- LH-6 Dick Cox, Outfitter
- LH-7 Loren Wichman, Self
- LH-8 Frank Haegen, rancher, secretary Fergus County Livestock Association, Livestock Association, Lewistown, MT
- LH-9 Bing VonBergan, Self, Moccasin, MT
- LH-10 Gilbert Lehfelt, Aviation Electronics, Lewistown, MT
- LH-11 Eldon Snyder, Outfitter
- LH-12 Larry Blasing, Inland Forest Resource Council, 110 East Broadway, Missoula, MT 59802
- LH-13 Ed Arnott, Utica, MT
- LH-14 Clint Dukman, Lewistown, MT

LIST OF WRITTEN RESPONDENTS
WILDERNESS COMMENTS FOR PUBLIC HEARING RECORD

MWSA LOG NO.	RESPONDENTS NAME AND ADDRESS	DATE COMMENT RECEIVED
MWSA-0115-L-001	Annalee Quist Moki Mac River Expedition 6829 Bella Vista Drive Salt Lake City, UT 84121	September 29, 1982
MWSA-0115-L-002	Robert A. Basse 5000 East Dartmouth Avenue Denver, CO 80222	September 27, 1982
MWSA-0115-L-003	David Schaenen 281 Poly Drive Billings, MT 59102	September 27, 1982
MWSA-0115-L-004	John S. MacNeill, Jr., P.C. 74 North West Street P.O. Box 320 Homer, NY 13077-0320	October 5, 1982
MWSA-0115-L-005	Leon J. Hinton, Manager of Land Sun Exploration & Production Co. Trinity Place Suite 1000 1801 Broadway Denver, CO 80202	October 4, 1982
MWSA-0115-L-006	George Wuerthner Box 7192 Missoula, MT 59807	October 5, 1982
MWSA-0115-L-007	Robert O. Bryon, Adm. Assistant True Oil Company P.O. Drawer 2360 Casper, WY 82602	October 6, 1982
MWSA-0115-L-008	Roberta Andersen Amoco Production Company Amoco Building 17th & Broadway Denver, CO 80202	October 12, 1982

MWSA LOG NO.	RESPONDENT'S NAME AND ADDRESS	DATE COMMENT RECEIVED
MWSA-0115-L-009	Roger Rosentreter Department of Botany University of Montana Missoula, MT 59812	October 13, 1982
MWSA-0115-L-010	Kathy Ryan 1765 NE North Street Hermiston, OR 97838	October 18, 1982
MWSA-0115-L-011	Jay B. Rosentreter 469 Miller Hall University of Montana Missoula, MT 59807	October 18, 1982
MWSA-0115-L-012	Mary Jean Lucachick 343½ W. Sussex Missoula, MT 59801	October 18, 1982
MWSA-0115-L-013	John R. Swanson P.O. Box 922 Berkeley, CA 94701	October 28, 1982
MWSA-0115-L-014	John R. Swanson P.O. Box 922 Berkeley, CA 94701	October 29, 1982
MWSA-0115-L-015	Reed Secord 2921 NE 53rd St. Lighthouse Point, FL 33064	November 8, 1982
MWSA-0115-L-016	Steve Buttress, Executive Director Economic Development Corp of GF 926 Central Avenue Great Falls, MT 59401	November 10, 1982
MWSA-0115-L-017	Grace & Russell Hodge Moccasin, MT 59462	November 16, 1982
MWSA-0115-L-018	Raths Livestock Box 478 Roundup, MT 59072	November 16, 1982
MWSA-0115-L-019	Jane Raths Wertheimer for Mr. & Mrs. Henry Wertheimer III Wertheimer Ranch Co. Box 6 Utica, MT 59479	November 16, 1982

<u>MWSA LOG NO.</u>	<u>RESPONDENT'S NAME AND ADDRESS</u>	<u>DATE COMMENT RECEIVED</u>
MWSA-0115-L-020	Dennis K. Brown, President INTERGEM Market Tower II 3025 S. Parker Rd., Suite 209 Aurora, co 80014	November 17, 1982
MWSA-0115-L-021	Harry Bullock Bullock Exploration Inc. Market Tower II 3025 S. Parker Rd., Suite 209 Aurora, CO 80014	November 17, 1982
MWSA-0115-L-022	Mike Petty 16694 E. Kent Drive Aurora, CO 80013	November 19, 1982
MWSA-0115-L-023	Steve Felsted 7734 So. Spruce St. Englewood, CO 80112	November 19, 1982
MWSA-0115-L-024	Teresa Kaiserski Madison Gallatin Alliance Box 875 Bozeman, MT 59715	November 19, 1982
MWSA-0115-L-025	Bill Cunningham The Wilderness Society P.O. Box 1184 Helena, MT 59601	November 22, 1982
MWSA-0115-L-026	Tom Swanz Box 69 Utica, MT 59479	November 23, 1982
MWSA-0115-L-027	David J. Bullock 3322 So. Sedalia Way Aurora, CO 80014	November 23, 1982
MWSA-0115-L-028	Stephen B. Gilpatrick Hilger, MT 59451	November 30, 1982
MWSA-0115-L-029	Gerald R. Dempster Box 104 White Sulphur Springs, MT 59645	December 1, 1982

<u>MWSA LOG NO.</u>	<u>RESPONDENT'S NAME AND ADDRESS</u>	<u>DATE COMMENT RECEIVED</u>
MWSA-0115-L-030	Don Pennell, President Lewistown Chamber of Commerce P.O. Box 818 Lewistown, MT 59457	November 30, 1982
MWSA-0115-L-031	Chanler C. Biggs 115 6th Avenue West Lewistown, MT 59457	November 30, 1982
MWSA-0115-L-032	Geoffrey E. Greene 1900 32nd St. South Great Falls, MT 59405	November 30, 1982
MWSA-0115-L-033	Stephen G. Gilpatrick Hilger, MT 59451	November 30, 1982
MWSA-0115-L-034	Leonard S. Thoe Spring Creek Forest Products, Inc. P.O. Box 128 Judith Gap, MT 59453	November 30, 1982
MWSA-0115-L-035	Jeff Sheldon Prairie Wind Box 626 Lewistown, MT 59457	November 29, 1982
MWSA-0115-L-036	R.J. Vinson, Division Land Manager Shell Oil Company P.O. Box 831 Houston, TX 77001	November 29, 1982
MWSA-0115-L-037	Delmer L. Brown, President International Geoscience 1095 Dudley Street Lakewood, CO 80215	November 30, 1982
MWSA-0115-L-038	Phil Korell Homestake Ranch on Highwood Rt. 1 Great Falls, MT 59401	December 3, 1982
MWSA-0115-L-039	Larry B. Blasing Inland Forest Resource Council 110 East Broadway, Room 320 Missoula, MT 59802	December 2, 1982

<u>MWSA LOG NO.</u>	<u>RESPONDENT'S NAME AND ADDRESS</u>	<u>DATE COMMENT RECEIVED</u>
MWSA-0115-L-040	M. Rupert Cutler National Audobon Society 950 Third Avenue New York City, NY 10022	December 2, 1982
MWSA-0115-L-041	Clifton R. Merritt American Wilderness Alliance 4260 East Evans Ave., Suite 8 Denver, CO 80222	December 3, 1982
MWSA-0115-L-042	Adela Awner 723 N. Ewing Street Helena, MT 59601	December 3, 1982
MWSA-0115-L-043	George Wuerthner Box 7192 Missoula, MT 59807	November 30, 1982
MWSA-0115-L-044	Earl E. Tresch Route 2, Box 2298 Lewistown, MT 59457	December 3, 1982
MWSA-0115-L-045	Dwight M. Willard 1074 Neilson Street Albany, CA 94706	December 3, 1982
MWSA-0115-L-046	John B. Sutherland 1810 16th St., #8 Lubbock, TX 79401	December 6, 1982
MWSA-0115-L-047	Dean A. Stensland 2208 Elm Billings, MT 59101	December 6, 1982
MWSA-0115-L-048	Roger Rosentreter 938 Poplar Missoula, MT 59801	December 6, 1982
MWSA-0115-L-049	Fred Woods Box 323 Hobson, MT 59452	December 6, 1982
MWSA-0115-L-050	Blaine Mooers P.O. Box 8821 Missoula, MT 59807	December 7, 1982
MWSA-0115-L-051	Dean A. Stensland 2208 Elm Billings, MT 59101	December 7, 1982
MWSA-0115-L-052	Fern D. Walter 860 2 Mile Drive Kalispell, MT 59901	December 9, 1982

<u>MWSA LOG NO.</u>	<u>RESPONDENT'S NAME AND ADDRESS</u>	<u>DATE COMMENT RECEIVED</u>
MWSA-0115-L-053	Lillian Martin P.O. Box 647 Columbia Falls, MT 59912	December 9, 1982
MWSA-0115-L-054	Inez Daniels Canyon Logging Box 70 Columbia Falls, MT	December 9, 1982
MWSA-0115-L-055	John A. Ulrich, Chairman Montana East Side Forest Practices Com. P.O. Box 389 Dillon, MT 59725	December 9, 1982
MWSA-0115-L-056	Alma Foster 908 10th Street Whitefish, MT 59937	December 8, 1982
MWSA-0115-L-057	Marilyn Whitman P.O. Box 955 Columbia Falls, MT 59912	December 8, 1982
MWSA-0115-L-058	James E. Bentley, Forest Lands Mgr. Champion International Corp. Milltown, MT 59851	November 26, 1982
MWSA-0115-L-059	Everett D. Bosch 912 Avenue C NW Great Falls, MT 59404	December 15, 1982
MWSA-0115-L-060	Jack H. Severns 2200 Juniper Avenue Great Falls, MT 59404	December 15, 1982
MWSA-0115-L-061	Hugh Zackheim Star Route A Twin Bridges, MT 59754	December 15, 1982
MWSA-0115-L-062	John Leatham 3126 4th Avenue South Great Falls, MT 59405	December 13, 1982
MWSA-0115-L-063	Grant Canoy 3221 3rd Avenue South Great Falls, MT 59405	December 13 1982
MWSA-0115-L-064	Earl W. Olsen 905 N. Ewing Helena, MT 59601	December 15, 1982
MWSA-0115-L-065	Ron Paulick 708 56th Street South Great Falls, MT 59405	December 15, 1982
MWSA-0115-L-066	David E. Anderson, M.D. P.O. Box 5012 Great Falls, MT 59403	December 17, 1982

MWSA LOG NO.	RESPONDENT'S NAME AND ADDRESS	DATE COMMENT RECEIVED
MWSA-0115-L-067	James Phelps 2110 Bradbrook Court Billings, MT 59102	December 17, 1982
MWSA-0115-L-068	Greg Mladenka 3921 Van Deman Fort Worth, TX 76116	December 15, 1982
MWSA-0115-L-069	George N. Engler, President Wildlands and Resource Assoc. 2412 5th Avenue South Great Falls, MT 59405	December 17, 1982
MWSA-0115-L-070	Larry B. Blasing, Director Inland Forest Resource Council 110 East Broadway, Room 320 Missoula, MT 59802	December 16, 1982
MWSA-0115-L-071	Loren M. Wichman RR 2, Box 2137 Lewistown, MT 59457	December 16, 1982
MWSA-0115-L-072	June and W.G. Belston 911 Jensen Road Columbia Falls, MT 59912	December 21, 1982
MWSA-0115-L-073	Ellen H. Arguimbau 1027 North Jackson Helena, MT 59601	December 21, 1982
MWSA-0115-L-074	Bernie A. Swift SE 206 Rose Lane Hamilton, MT 59840	December 21, 1982
MWSA-0115-L-075	Thomas C. Moe ? Lewistown, MT 59457	December 21, 1982
MWSA-0115-L-076	Lee Silliman 802 St. Marys Deer Lodge, MT 59722	December 21, 1982
MWSA-0115-L-077	John Gilpatrick General Delivery Hilger, MT 59451	December 21, 1982
MWSA-0115-L-078	Francis J. Zahler ?	December 21, 1982
MWSA-0115-L-079	Carley McCaulay 1305 2nd Avenue North Great Falls, MT 59401	December 21, 1982

MWSA LOG NO.	RESPONDENT'S NAME AND ADDRESS	DATE COMMENT RECEIVED
MWSA-0115-L-080	Howard F. Strause 1508 3rd West Hill Drive Great Falls, MT 59405	December 28, 1982
MWSA-0115-L-081	D. Mark Bearrow, Jr. 405 West Virginia Lewistown, MT 59457	January 21, 1983
MWSA-0115-L-082	Mr. Paul L. Reese 1124 W. Blvd. Lewistown, MT 59457	January 21, 1983
MWSA-0115-L-083	Lynn M. Seelye "no return address"	January 21, 1983
MWSA-0115-L-084	Sharlon L. Willows, Coord. Canyon Coalition Box 422 Hungry Horse, MT 59919	January 21, 1983
MWSA-0115-L-085	Laurence R. Sutton 3318 Sundance Drive Bozeman, MT 59715	January 21, 1983
MWSA-0115-L-086	Rick Reese 555 South Roberts Helena, MT 59601	January 21, 1983
MWSA-0115-L-087	Albert Honican 5004 38th Avenue Minneapolis, MN 55417	January 21, 1983
MWSA-0115-L-088	Arlo Skari Box 296 Chester, MT 59522	December 28, 1983
MWSA-0115-L-089	Edward Dobson Box 882 Billings, MT 59103	December 20, 1983
MWSA-0115-L-090	Matt Hansen 2407 Wylie St. Missoula, MT 59802	December 14, 1983
MWSA-0115-L-091	Barbara Buentemeir Mt. Women In Timber-NW Chapter 2225 Billow Rd. Columbia Falls, MT 59912	December 14, 1983

MWSA LOG NO.	RESPONDENT'S NAME AND ADDRESS	DATE COMMENT RECEIVED
MWSA-0115-L-092	C.E. "Ted" Lucas Highwood, MT 59450	December 8, 1983
MWSA-0115-L-093	Phil Korell Highwood Rt 1 Great Falls, MT 59401	December 8, 1983

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