APPENDIX B

ANALYSIS PROCESS

DEVELOPMENT OF THE FOREST PLANNING MODEL (SPECTRUM)

Land management planning is the major mechanism for making large-scale and long-term forest land allocations and resource management decisions. Planning consists largely of exploring a national forest's productive potential and experimenting with various allocation choices. Modeling is a primary planning tool because it permits studying the consequences of choices without actually committing valuable resources to experimentation or having to wait many years to observe an outcome. It can also help to evaluate whether desired future conditions are feasible when taking all resource management goals and objectives into consideration. However, decisions about structuring land allocations, choosing and pursuing trade-offs, and accepting one result instead of another are made by people, not the model. The model is merely a device for organizing elements of the decision problem, discovering possible choices and identifying potential conflicts. The SPECTRUM (USDA Forest Service, Inventory and Monitoring Institute) model is an evolved version of FORPLAN, a linear programming (LP) model that solves for an overall objective, such as maximizing present net worth of benefits and costs, or maximizing the amount of certain yields. It is an excellent tool for determining the most cost-efficient way to reach objectives and for analyzing the impacts to vegetative conditions over time from various management activities.

In the past, this modeling technique has been used to make land allocation decisions; however, for this Forest Plan revision, those land allocations were essentially determined through a process of the mapping of the management prescriptions that varied for each alternative: a process which heavily involved the public. Therefore, within SPECTRUM, the land allocation-management prescription assigned to every acre was 'hard-wired' in the model through the use of analysis unit prescriptions. Because silvicultural treatments are one of the primary means of managing vegetation and wildlife habitat, and can be readily modeled, the SPECTRUM model was constructed principally to examine how timber management could be used to achieve the goals and objectives for each alternative and for the individual management prescriptions. The Chattahoochee-Oconee SPECTRUM model was thus constructed to be a timber harvest allocation model, i.e. it was used to model management constraints and to determine the most efficient way of meeting management objectives through the use of silvicultural prescriptions. Only benefits and costs pertaining to the timber program were included in the model. The effects from other type treatments on vegetation and other resources were addressed outside of the model, based on timber-related outputs from the SPECTRUM model.

SPECTRUM MODEL OVERVIEW

The model was designed and solved in the following steps:

Model creation - Designing a SPECTRUM model was the most intensive of the four steps. In this step the modeler input resource data, specified resource interactions, set goals and objectives, outlined management actions, defined activities and outputs, set the planning horizon, stratified the landscape into similar response areas, and input economic data

.

Matrix Generation - Generating the matrix was the process of converting the input from step one to a matrix of rows and columns that the optimization software could solve.

Optimization of the Solution - The commercial software, C-Whiz (C-Whiz, KETRON Management Science), was used to solve the matrix. The linear programming solver found the best mix of management actions to meet the management objectives.

Interpretation of the Solution- The final step in the modeling process was to use the reports created in SPECTRUM, analyzed with statistical software (SAS Institute inc.) and spreadsheets to interpret the results of the optimization and perform sensitivity analyses. The eight basic components of the SPECTRUM model include the following and are discussed individually in this section:

- The planning horizon;
- Land stratification;
- Silvicultural prescriptions;
- Activities and outputs and their associated costs and benefits;
- Rotation ages;
- Yield coefficients;
- Constraints;
- The overall management objectives.

PLANNING HORIZON

Each SPECTRUM model has a specified time frame called a 'planning horizon' that may be as short or long as desired and is broken into time periods of 10 years each. The Chattahoochee-Oconee SPECTRUM model used a planning horizon of 200 years, with 20 time periods, or decades. Activities and outputs are primarily represented in SPECTRUM on a decadal basis, occurring at the midpoint of the decade.

LAND STRATIFICATION (ANALYSIS AREAS)

Analysis areas are defined as units of land, not necessarily contiguous, which can be considered to be homogeneous with respect to responses to treatment in terms of yields, costs, and values received for resource outputs. Management objectives or constraints are also expected to be relatively the same throughout an analysis area. In SPECTRUM, each analysis area is allowed up to six stratification categories to identify its unique responses to treatments, yields, costs, values and constraints.

Once acres, activities, costs, and revenues had each been compiled, these all had to be entered into the SPECTRUM linear programming model for the actual economic analysis. It is the SPECTRUM model which schedules the harvest of timber, associates types of harvest with yields, calculates the value of harvested wood, and also compounds and discounts costs and revenues to make them comparable in spite of the lapse of time.

As the Chattahooochee-Oconee's SPECTRUM model was constructed, many different land stratifications were considered. Among those considered but ultimately dropped was the watershed management area within which the acres occurred. The watershed scale was that of the 5th level hydrologic unit (HUC) as defined and mapped by the US Geological Survey. It was decided that HUCs, while greatly increasing the complexity of the model, did not add significantly to its usefulness.

The table below shows the SPECTRUM land stratification variables that were ultimately used, the possible number of values of each, and the total number of potential analysis units that could be created using this stratification.

Table B-29 SPECTRUM Stratification Variables

Variable	Number of Possible Values	Cumulative Number of Possible Analysis Units
ECS Section	3	3
Old Growth Community Type	12	36
Seral Stage	5	180
Management Prescription	App. 40	7,200
Slope Class	2	14,400
Roading	2	28,800

This number is much higher than actually occurred in any alternative because: (1) the number of management prescriptions varied; (2) they included old growth types, slope, etc varied by the suitable prescriptions; (3) some of the combinations do not physically exist on the ground; and (4) where extremely small analysis units were created (< 10 acres) these were combined into the most logical analysis unit. For example, if two units varied only by slope category, with 2 acres in the 0-45% category and 400 acres in the 45+ category, the two were combined into one, 402 acre, 45+ slope category analysis unit. Also, (5) because the model forced all 'non-suitable' acres into a 'minimum management' management action (i.e. no

commercial timber harvest). All acres that were unsuitable were lumped into a non-suitable category (NS). These non-suitable acres were also lumped without regard to slope or roading class, since these classes were only used in the model to differentiate logging costs and revenues and were therefore irrelevant in unsuitable areas. These acres were grouped into their appropriate community type, seral stage and ecological section only. This allowed the model to 'grow' these acres so seral stage changes over time could be captured. The actual number of analysis units ranged from a low of 388 in alternative F to a high of 875 in alternative I_M.

Some forests used the scenery management system (SMS) as one of the level identifiers. The Chattahoochee-Oconee chose not to do this because the SMS was used heavily in assigning the MRxs; therefore, those concerns were addressed by management direction within the various MRxs. For example, many of the SMS class 1 areas, were assigned a MRx in the 4.F series – scenic areas.

Table B-30. Number of Analysis Units in each Alternative.

Alternative	Number of Analysis Units
A	833
B	830
D	831
E	605
F	388
G	483
I	875

SILVICULTURAL PRESCRIPTIONS

Each timber analysis area was given numerous choices of harvest options, both in terms of harvest method and in terms of the timing choices made available. Harvest options included: no thinning, a single thin, three thinnings, uneven-aged, shelterwood, and clearcut. All analysis areas were also given a choice of 'minimal level,' which equates to the 'grow only' option used for all non-suitable lands. The total number of combinations of analysis units and harvest options amounted to approximately 200,000 in each alternative.

The SPECTRUM model also was simultaneously calculating the total value of all timber harvested in each decade by multiplying the harvest volume in each appraisal group by the value per unit volume. These figures were also being discounted to the year 2000.

The model was also calculating costs by multiplying cost coefficients by either the acres treated or the volume, depending upon how the coefficient was expressed. Each harvest activity had a sale preparation cost, a harvest administration cost, an inventory and NEPA cost, and a transportation planning cost. Regeneration harvests had, in addition to these costs, a site preparation cost. These costs figures were also

discounted back to the year 2000. The great degree of complexity in the model resulted in problems running the software on a desktop computer. The latitude for additional refinement is limited in some alternatives with a large proportion of suitable acres.

Table B-31. SPECTRUM Management Actions Made Available in the Model.

Management Actions	Description
CC 0T/0T	Harvest with No thinning.
CC 0T/1T	Harvest with No thinning in existing stand but one thin in the regenerated stand.
CC 0T/3T	Harvest with No thinning in existing stand but three thinnings in the regenerated stand.
CC 1T/1T	Harvest with one thin in existing stand and in the regenerated stand.
CC 3T/3T	Harvest with three thinnings in existing stand and in the regenerated stand.
MN	No harvest of any type -grow only.
SW 0T/0T	Shelterwood Harvest with a portion removed and then the residual removed two decades later.
SW for the Birds	Shelterwood Harvest with a portion removed and then the residual left standing (used in RCW habitats).
UEAM	Uneven aged management with 20% removal every two decades.

ACTIVITIES AND OUTPUTS

To properly associate both costs and benefits of various activities and outputs in SPECTRUM, these must be explicitly defined and given values Table B-32 shows the activities defined and used in the SPECTRUM model.

Table B-32. SPECTRUM Activities

Activities	Description	Unit Of Measure	Period Or Year?	Per Area Or For Entire Analysis Unit	Economics
Harv_admin	Harvest admin costs	MCF	Period	Per Area	Yes
Inv_NEPA	Inventory and NEPA costs	MCF	Period	Per Area	Yes
Road-Cost	Road construction costs	Mile	Period	Per Area	Yes
Road-Reconst	Road construction costs	Mile	Period	Per Area	Yes
Sale_prep	Sale preparation costs	Acres	Period	Per Area	Yes
SitePrep_Art	Site preparation -Artificial	Acres	Period	Per Area	Yes
SitePrep_Nat	Site preparation -Natural	Acres	Period	Per Area	Yes

The outputs for the model are defined in Table B-33. This section of the model can be somewhat confusing, as the 'outputs' can refer to several things, from true outputs expected to be produced (i.e. Volume of timber) to formulas used to calculate values to acre tracking 'counters' (i.e. Acres allocated to uneven aged management).

Table B-33. SPECTRUM Outputs

Output	Description	Unit of measure	Period or Year	Per area or entire analysis unit?	Economics?
All-Hard	Total Hardwood volume	MCF	Period	Area	No
All-Soft	Total Softwood volume	MCF	Period	Area	No
HVH	High Value Hardwood	MCF	Period	Area	Yes
HVM	Mid Value Hardwood	MCF	Period	Area	Yes
HVL	Low Value Hardwood	MCF	Period	Area	Yes
HVP	Hardwood Pulp	MCF	Period	Area	Yes
SVH	High Value Softwood	MCF	Period	Area	Yes
SVM	Mid Value Softwood	MCF	Period	Area	Yes
SVL	Low Value Softwood	MCF	Period	Area	Yes
SVP	Softwood Pulp	MCF	Period	Area	Yes
**VOL	Volume: includes all volume Variables defined above except pulp	MCF	Period	Area	No
** rVOL	Volume: includes All-Hard and All-Soft	MCF	Period	Area	No
*F-all-hard	Copy of Total Hardwood volume	MCF	Period	Area	No
*F-all-soft	Copy of Total Softwood volume	MCF	Period	Area	No
*F-hvh	Copy of High Value Hardwood	MCF	Period	Area	No
*F-hvm	Copy of Mid Value Hardwood	MCF	Period	Area	No
*F-hvl	Copy of Low Value Hardwood	MCF	Period	Area	No
*F-svh	Copy of High Value Softwood	MCF	Period	Area	No
*F-svm	Copy of Mid Value Softwood	MCF	Period	Area	No
*F-svl	Copy of Low Value Softwood	MCF	Period	Area	No
INV	Predefined: Ending Inventory	MCF	Year	Area	No
LTSY	Predefined: Long Term Sustained Yield	MCF	Year	Area	No
**ASQ	Predefined: Allowable Sale Quantity	MCF	Period	Area	No
SAV	Predefined: Standing Average Volume	MCF	Year	Area	No
SSE	Acreage of Early Successional Stage	Acres	Period	Area	No
SSS	Acreage of Sappling Successional Stage	Acres	Period	Area	No
SSM	Acreage of Mid Successional Stage	Acres	Period	Area	No
SSL	Acreage of Late Successional Stage	Acres	Period	Area	No
SSO	Acreage of Old Successional Stage	Acres	Period	Area	No
Total Acres	Total Acres	Acres	Period	Area	No

* Used only in formula calculations.
** A composite of several other outputs.

Table B-34 shows the costs associated with the various activities that are shown in
.

Table B-34. Costs associated with SPECTRUM Activities

Activities	Description	Cost	Unit of measure
Harv_admin	Harvest administration costs	$60	MCF
Inv_NEPA	Inventory and NEPA costs	$200	MCF
Road-Cost	Road construction costs	$27,750	MILE
Road-Reconst	Road construction costs	$20,250	MILE
Sale_prep	Sale preparation costs	$120	Acres
SitePrep_Art	Site preparation -Artificial	$115	Acres
SitePrep_Nat	Site preparation -Natural	$85	Acres

SPECTRUM CONSTRAINTS

Several constraints were developed for the SPECTRUM model in response to standards and guidelines and the management requirements in the NFMA regulations *(36 CFR 219.27*). Constraints were also developed in response to management goals and to improve the model's simulation of actual management of the Forest.

- Constraints assigning congressionally and administratively designated areas to specific prescriptions.
- Constraints ensuring that the management requirements are met in each alternative
- Timber scheduling constraints
- Operational constraints that constrain timber harvest to a realistic solution

The following SPECTRUM constraints were applied to all alternatives. Essentially SPECTRUM models for all alternatives were the same, thus the real differentiating features of the models were the differences in land allocation into the different management prescriptions. This allowed for valid comparison of the effects of the changes in allocation between alternatives.

1. Long Term Sustained Yield (LTSY) and Non-declining Yields

Long-term sustained yield (LTSY) is defined as "the highest uniform wood yield from lands being managed for timber production that may be sustained under a specified management intensity consistent with multiple-use objectives" (USDA FS 1982 - CFR 219.3). LTSY is potential average growth, and is displayed in SPECTRUM as an annual yield for the last period. The long-term sustained yield (LTSY) constraint is used to ensure that the harvest of timber in the last decade is not greater than the long-term timber production capacity of the Forest. Long-term sustained yield capacity is computed using the acreage scheduled to each regeneration prescription applied in the model

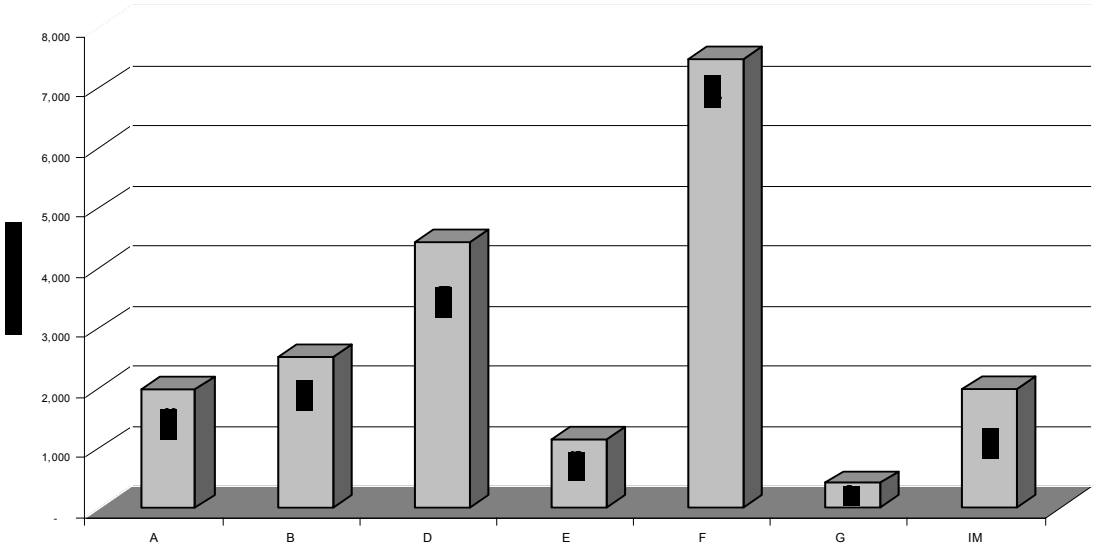

Figure B-2. Long Term Sustained Yield Results From Each Alternative

2. Perpetual Timber Harvest Constraint

This NFMA required constraint is used to ensure that the remaining timber inventory will allow achievement of non-declining harvest levels beyond the modeling horizon. To achieve this condition the constraint requires that the Forest contain as much timber inventory volume at the end of the last period as the Forest would have, on the average, under the management intensities selected in the analysis. Without this constraint the SPECTRUM model would have no reason to leave enough inventory at the end of 150 years to sustain timber harvest levels into perpetuity.

3. Non-declining Yield

This constraint, also a NFMA requirement, is used to ensure that the harvest of timber in a decade is greater than or equal to the harvest of timber in the previous period. This constraint indirectly limits the model to a lower present net value and reduced flow of timber in the early decades, but also provides community economic and social stability through the controlled flow of timber.

4. Management Requirements Constraints

This set of constraints is used to limit the model so that the management actions and intensities selected are consistent with the emphasis of an individual alternative. Some of these constraints are specifically defined in the constraint section of the model and others are implemented through the definitions of the management

actions, the management action theming, and the definitions of the scheduling options. For example, if there are no schedules defined for a specific prescription, then analysis units that contain that prescription are constrained to only allow minimum level management. In addition, maximum and minimum levels of early successional conditions are constrained for the different prescriptions and alternatives, as are levels of thinning, amounts of woodland management, loblolly pine conversion, and uneven-aged management. For all alternatives except Alternative F, the early succession constraint proportions for the different prescriptions are based on the desired conditions developed by the FWBRE Team. Additional details for these constraints are contained in the Process Record.

5. Riparian Constraint

The decision was made not to allow the SPECTRUM model to call for harvests within a riparian corridor. This was accomplished by reducing the acres of each community type by a specified percent as shown in Table B-35. The percent of reduction was determined by a GIS analysis that overlayed a 100-foot buffer of blue line streams on the coverage of community type. Then determining the percent of the total of that community that fell within this corridor. This number was calculated separately for each ecological section. These percentages were not removed from the Current Management alternative (F), since this alternative is supposed to reflect the 1985 Plan, as amended.

Table B-35. Adjustments to the SPECTRUM Model to Eliminate Scheduled Timber Harvest in Riparian Corridors

Ecological Section	Community Type	Percent Riparian (Removed from Model)	Percent Not Riparian
231D	13	26%	74%
231D	21	7%	93%
231D	22	5%	95%
231D	24	3%	97%
231D	25	6%	94%
231D	5	14%	86%
M221D	13	26%	74%
M221D	2	8%	92%
M221D	21	7%	93%
M221D	22	5%	95%
M221D	24	3%	97%
M221D	25	6%	94%
M221D	28	25%	75%
M221D	5	14%	86%
231A	13	25%	75%
231A	2	8%	92%
231A	21	17%	83%
231A	22	5%	95%
231A	24	3%	97%
231A	25	15%	85%
231A	27	22%	78%
231A	28	49%	51%
231A	5	19%	81%

6. Early Successional Constraints

The fish, wildlife, range, ecological and botanical team (FWREB) set certain goals for wildlife habitat within the different MRxs. Some of these were incorporated into the SPECTRUM model, specifically, the early successional habitat goals.

Table B-36. Early Successional Constraints by MRx

Rx	Description	Early Successional Option	Early Successional Goal	Suitable
12.A	Remote Backcountry Recreation - Few Open Roads	2	<=4%	N
2.A.3	Designated Recreational Rivers	2	<=4%	N
2.B.3	Recommended Recreational Rivers	2	<=4%	N
3.A	National Scenic Areas	2	<=4%	N
3.C	National Recreation Areas	2	<=4%	N
3.D	Proposed National Recreation Areas	2	<=4%	N
4.A	Appalachian Trail Corridor	2	<=4%	N
4.C	Geologic and Paleontologic Areas	2	<=4%	N
4.F.2	Regional Forester Scenic Areas	2	<=4%	N
4.H	Outstandingly Remarkable Streams	2	<=4%	N
4.I	Natural Areas with Few Open Roads	2	<=4%	N
4.K	Educational Forest	2	<=4%	N
6.E	Old Growth Core Areas Surrounded by Uneven-aged Management	2	<=4%	N
7.D	Concentrated Recreation Zones	2	<=4%	N
7.E.1	Dispersed Recreation Areas	2	<=4%	N
3.B	Experimental Forests	3	4-10%	N
4.G.1	Experimental or Demonstration Forests	3	4-10%	N
0	Custodial Management	1	No Goal	N
1.A	Designated Wilderness/Wilderness Study Areas	1	No Goal	N
1.B	Recommended Wilderness Study Areas	1	No Goal	N
11	Riparian Areas	1	No Goal	N
12.B	Remote Backcountry Recreation - Nonmotorized	1	No Goal	N
12.C	Remote Backcountry Recreation - Natural Processes	1	No Goal	N
2.A	Designated Wild and Scenic Rivers	1	No Goal	N
2.A.1	Designated Wild Rivers	1	No Goal	N
2.A.2	Designated Scenic Rivers	1	No Goal	N
2.B.1	Recommended Wild Rivers	1	No Goal	N
2.B.2	Recommended Scenic Rivers	1	No Goal	N
4.B	Research Natural Area	1	No Goal	N
4.D	Botanical and Zoological Areas	1	No Goal	N
4.E.1	Cultural and Heritage Areas	1	No Goal	N

Table continued next page.

Rx	Description	Early Successional Option	Early Successional Goal	Suitable
4.F	Scenic Areas	1	No Goal	N
5.A	Administrative Sites	0	No Goal	N
5.D	Military Use Areas	0	No Goal	N
6.A	Old Growth - Natural Process Emphasis	1	No Goal	N
6.B	Areas Managed to Restore or Maintain Old Growth Characteristics	1	No Goal	N
6.C	Old Growth Managed with Natural Process and Restoration Activities	1	No Goal	N
9.F	Rare Communities	1	No Goal	N
4.F.1	Scenic and Wildlife Management Areas	2	<=4%	Y
4.J	Urban/Suburban Interface	2	<=4%	Y
6.D	Old Growth Core Areas Surrounded by Extended Forest Rotations	2	<=4%	Y
7.A	Scenic Byway Corridors	2	<=4%	Y
7.B	Scenic Corridors and Sensitive Viewsheds	2	<=4%	Y
7.C	OHV Use Areas	2	<=4%	Y
8.A.2	Area Sensitive, Mid- to Late-Successional Forest Emphasis	2	<=4%	Y
9.A.1	Source Water Protection Watersheds	2	<=4%	Y
9.A.3	Watershed Restoration Areas	2	<=4%	Y
10.A	Sustained Yield Timber Management	4	10-17%	Y
10.D	Grazing and Forage Emphasis	4	10-17%	Y
8.B	Early-Successional Habitat Emphasis	4	10-17%	Y
8.B.1	Early-Successional Habitat Emphasis	4	10-17%	Y
8.E.1	Ruffed Grouse Habitat Management Area	4	10-17%	Y
8.E.3	High Elevation Early Successional Habitat	4	10-17%	Y
10.B	High Quality Forest Products Emphasis	3	4-10%	Y
10.E	Timber Management with Recreation Emphasis	3	4-10%	Y
7.E.2	Dispersed Recreation Areas with Vegetation Management	3	4-10%	Y
8.A.1	Mid- to Late-Successional Forest Emphasis	3	4-10%	Y
8.D	Red-cockaded Woodpecker Habitat Management Areas	3	4-10%	Y
8.D.1	Red-cockaded Woodpecker Subhabitat Management Areas	3	4-10%	Y
9.G	Restoration	3	4-10%	Y
9.H	Restoration of Plant Associations to Their Potential	3	4-10%	Y

BENCHMARK ANALYSIS

Benchmark analysis is specified in the NFMA regulations in *36 CFR 219.12(e)* as part of the Analysis of the Management Situation. Benchmarks approximate maximum economic and biological resource production opportunities, and are useful in evaluating the compatibilities and conflicts between individual resource objectives and in defining the range within which integrated alternatives can be developed. Selection of those benchmarks to develop is dependent upon the revision topics. Benchmarks are primarily modeled in SPECTRUM by changing the objective function and by adjusting constraints. Because the SPECTRUM model was developed to primarily model vegetation management through the use of timber sales, three timber-related benchmarks were developed in addition to one that reflected our current level of management.

The NFMA regulations in *36 CFR 217.27* lists management requirements that must be considered in benchmarks. The following basic management requirements were included in all of the benchmark SPECTRUM models:

- Non-declining flow and long-term sustained yield.
- Allowable Sale Quantity only generated from tentatively suitable timber lands.
- Water quality and watershed protection.
- Riparian protection.
- Base level of visual resource protection.
- No harvest before the culmination of mean annual increment.

CURRENT LEVEL BENCHMARK

This benchmark provides for management using the current plan as amended, adjusted to incorporate changes necessary to meet current management direction. The benchmark estimates the capability of the planning areas to provide for a wide range of goods, services, and other uses from the present land allocations. This benchmark was the same as Alternative F, and meets all requirements specified in the regulations *(36 CFR, Part 219)*. This model was constructed by modifying the model pattern for the other alternatives. No riparian corridor acreage was removed before running this model. The management prescriptions were assigned using the current plan management area designation. A crosswalk was created to provide the best fit. There were only four suitable prescriptions in Alternative F. They were assigned as follows: MA-16 to MRx 10.A; MA-11 to MRx 7.E.2; MA-17 to MRx 8.D.1; and MA-12 to MRx 7.D.

MAXIMUM TIMBER BENCHMARK

This benchmark was used to identify the timber production potential of the Forest, subject to these specifications:
The objective function maximizes timber volume in the first five decades, with a rollover to maximize present net value for 15 decades.
All tentatively suitable acres were included, with a full range of silvicultural prescriptions available. No successional habitat constraints were applied.

MAXIMUM PRESENT NET VALUE BENCHMARK

This benchmark was established to estimate the schedule of outputs and costs that would maximize the present net value of timber production without any constraints, subject to these specifications:

- The objective function maximizes net present value over the entire planning horizon.
- All tentatively suitable acres were included, with a full range of silvicultural prescriptions available.
- No successional habitat constraints were applied.

TIMBER SUITABILITY ANALYSIS IN SPECTRUM

The "Stage 2 Suitability Analysis" is an economic analysis of each Analysis Unit (AU) in SPECTRUM. It is defined in *36 CFR 219.14(b*). It is meant to answer two questions:

- Which lands are "above cost?"
- Which management intensity is the most economical for each Analysis Unit?

In making this run, all of the "tentatively suited" lands have the range of harvesting options considered for the alternatives available to them. For this analysis, the management prescription level identifier for all tentatively suited lands was set to MRx 10.A, the prescription that provided the most silvicultural options for each analysis unit. This version of the model was run unconstrained with a maximum PNV objective function for 15 periods.

Table B-37. Stage 2 results

	Acres Not Cost Effective	Acres Not Cost Effective Allocated to a Suitable Rx in Alt I	*Modeled for Timber in Alt I
Chattahoochee	136,231	71,444	66,970
% of forested acres	18%	10%	9%
Oconee	3,027	1,863	1,863
% of forested acres	3%	2%	2%
Total	139,258	73,307	68,833
% of forested acres	16%	8%	8%

*Slopes above 45% were not modeled.

Some acres that were not cost effective were modeled in the SPECTRUM analysis for alternative I. This was done because producing cost effective timber harvests was not a goal of the preferred alternative. These lands were allocated to suitable Rx's because of other priorities, for example, to benefit forest health or wildlife habitats.

Among the methods of harvest modeled, clear-cutting was by far the most economical. Analysis units in which the model chose this method had much greater PNVs ($0.88 as opposed to a $-0.70 for acres place in uneven aged management. The Maximize present net value model never chose the shelterwood method of harvest.

MINIMAL LEVEL OF MANAGEMENT BENCHMARK

This benchmark represents "the minimum level of management which would be needed to maintain and protect the unit as part of the National Forest System together with associated costs and benefits" *(36 CFR 219.12(e)(1)(i))*. In Chapter 2 of the EIS, it is compared to the management emphasis of Alternative C, which was originally considered but was eventually eliminated from detailed study. Alternative C essentially embodied all of the elements of a minimum level of management benchmark by only providing for the protection of resources and meeting legal requirements. This benchmark shows no commercial timber production or harvest; therefore the ASQ is zero. In this benchmark, no early successional habitat conditions are created. Figure B-3 shows the change in successional stage on the Forests under minimal level management. This is essentially a "grow only" scenario.

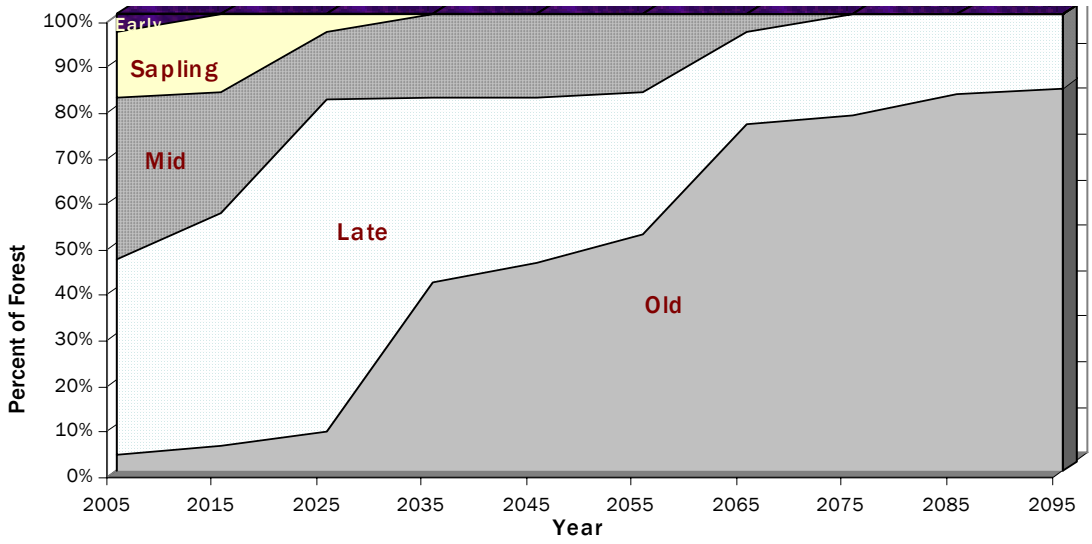

Figure B-3. Patterns of Change in Successional Class Over time with no Active Management

Among the reasons to drop alternative C from detailed study is that some ecosystems require some active management. Active management will be necessary to restore and maintain desired conditions relative to a number of habitat elements (Table 3-38). These habitat elements are important to maintaining viability of associated species.

Table B-38. Some Habitat Elements On The Chattahoochee-Oconee NF That May Require Active Management, And The Primary Management Activities Likely To Be Needed

Habitat Element	Primary Management Activities
Bogs, Fens, Seeps, Seasonal Ponds	Tree cutting, prescribed burning
Glades and Barrens	Tree cutting, prescribed burning
Table Mountain Pine Forests	Tree cutting, prescribed burning
Grassy Balds	Herbicide application, prescribed burning
Shrub Balds	
Canebrakes	Tree cutting, prescribed burning, herbicide application
Sandhills	Tree cutting, prescribed burning
Wet Savannas and Flatwoods	Tree cutting, prescribed burning
	Tree cutting, prescribed burning
Mature Yellow Pine Forests	
Longleaf Pine Forests	Tree cutting, prescribed burning, tree planting
Mountain Longleaf Pine Forests	Tree cutting, prescribed burning, tree planting
Early-Successional Forests	Tree cutting
	Tree cutting, prescribed burning
Canopy Gaps	
Woodlands, Savannas, and Grasslands	Tree cutting, prescribed burning
Mixed Landscapes	Tree cutting, prescribed burning
Early-Successional Riparian	Tree cutting

In the following table (Table B-39), some opportunity costs of the different management philosophies can be evaluated.

Table B-39. Tradeoffs Among Benchmarks – Average Annual in Decade 1

	Forest	Current Mgmt (Alt F)	Maximum Timber	Present Net Value	Minimum Level of Management
Allowable Sale Quantity (ASQ), MCF/decade	Both	264,032	339,419	281,721	0
Long-term Sustained Yield, MCF/year	Both	264,032	339,419	281,721	0
Present Net Value	Both	45,842,056	45,004,736	74,229,232	0
Early Successional %, end of decade 1	Chatt	8	10	8	3
Early Successional %, end of decade 1	Oconee	28	23	34	6
Early Successional %, end of decade 5	Chatt	6	4	6	0
Early Successional %, end of decade 5	Oconee	14	24	21	0
Old Successional %, end of decade 1	Chatt	3	3	2	4
Old Successional %, end of decade 1	Oconee	0	0	0	0
Old Successional %, end of decade 5	Chatt	36	41	33	50
Successional %, end of decade 5	Oconee	13	12	12	15

Among the many concerns expressed about the future of the Forest, is a concern about the patterns of successional stages on the forest. Benchmark analysis can help to show differences in succession the may be seen under alternative management scenarios. The figures that follow (Figure B-4 to Figure B-7) show changes in successional patterns over five decades as predicted by various SPECTRUM benchmark runs. In the legend for these figures:

- SSE = seral stage, early
- SSS = seral stage, sapling
- SSM = seral stage medium
- SSL = seral stage late
- SSO = seral stage old

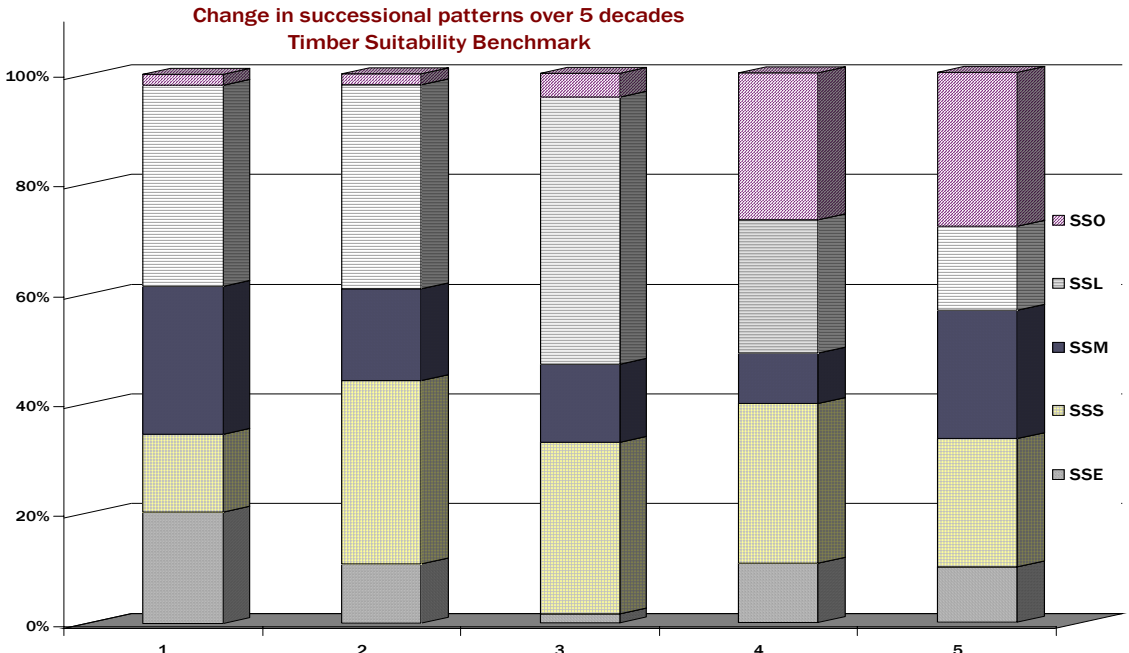

Figure B-4. Change In Successional Patterns (Percent In Each Seral Stage) Over Five Decades, As Predicted In The Timber Suitability Analysis Benchmark SPECTRUM Run.

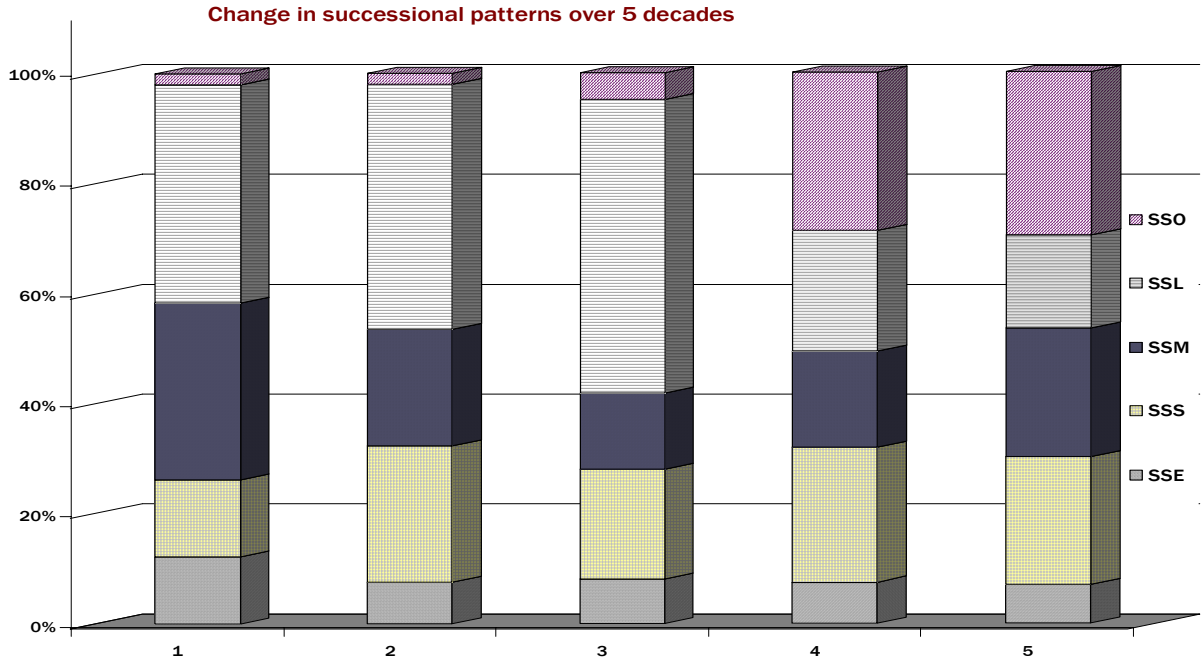

Figure B-5. Change In Successional Patterns (Percent In Each Seral Stage) Over Five Decades, As Predicted In The Maximize Volume Analysis Benchmark SPECTRUM Run

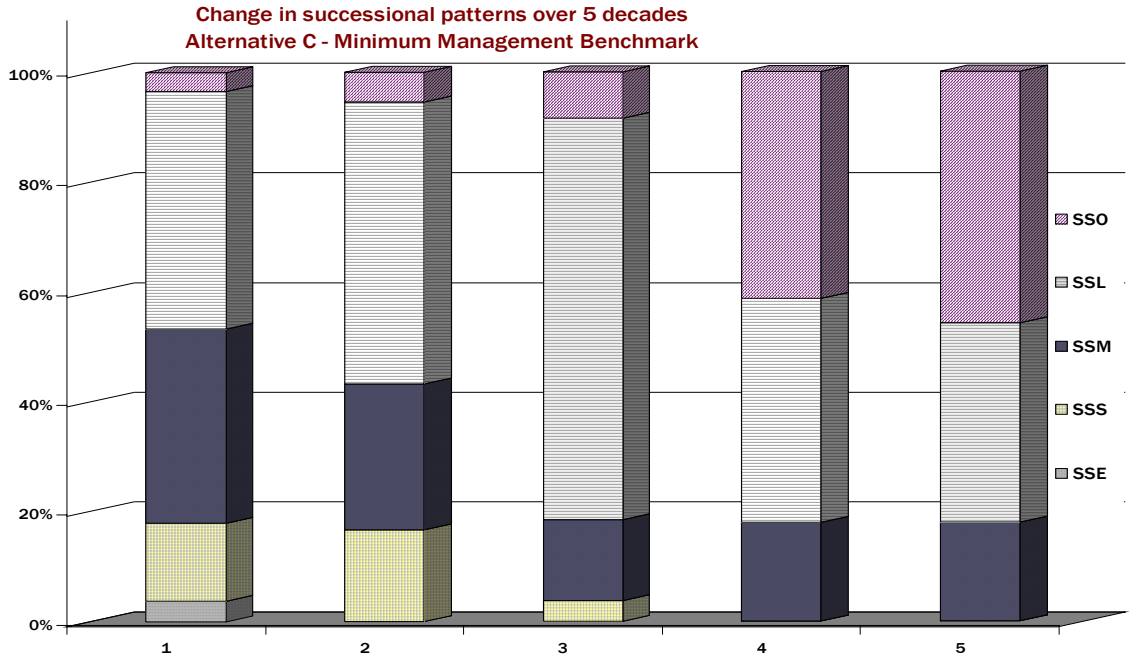

Figure B-6. Change In Successional Patterns (Percent In Each Seral Stage) Over Five Decades, As Predicted In The Minimum Management (Alternative C) Analysis Benchmark

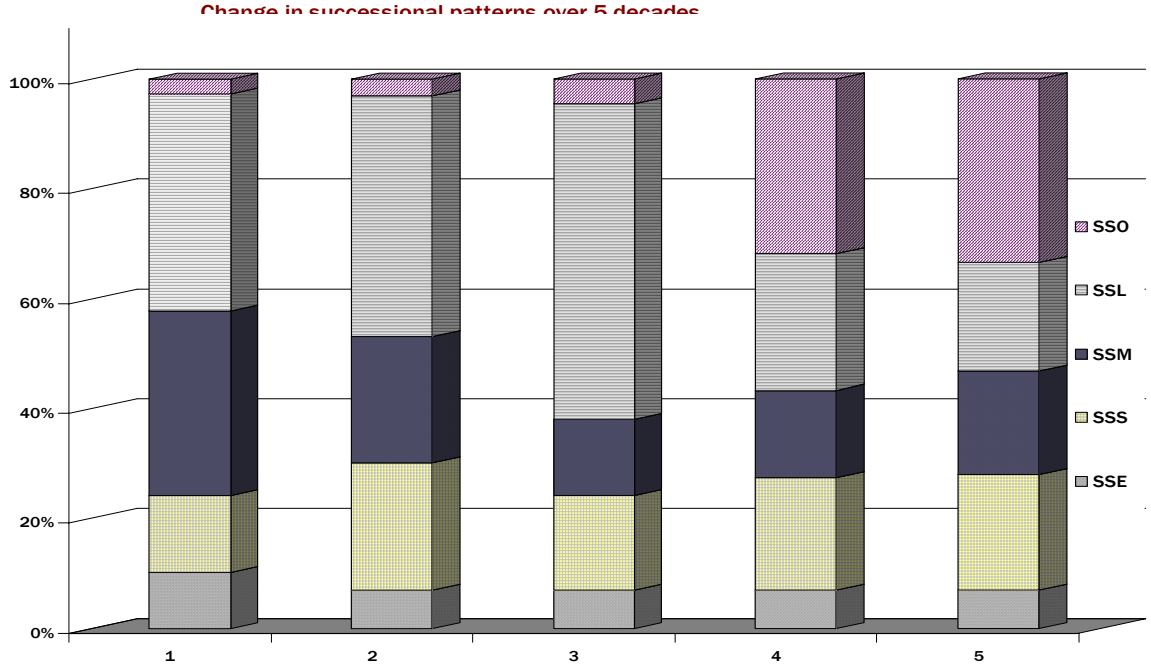

Figure B-7. Change In Successional Patterns (Percent In Each Seral Stage) Over Five Decades, As Predicted In The Current Management Analysis (Alternative F) Benchmark SPECTRUM Run.

STAGE 3: IDENTIFICATION OF SUITABLE ACRES

Stage 3 analysis was accomplished during the formulation of alternatives. Three criteria were used during this stage to identify lands as not suited for timber production:

Based upon a consideration of multiple use objectives for the alternative, the land is proposed for resource uses that preclude timber production, such as Appalachian Trail Corridor and Wild and Scenic Rivers.
Other management objectives for the alternative limit timber production activities to the point where management requirements set forth in *36 CFR 219.27* cannot be met.

The lands are not cost efficient, over the planning horizon, in meeting Forest objectives, which include timber production.

Table B-40. . Allocation of acres to various management prescriptions and their suitablity status for the Chattahoochee National Forest.

Chattahoochee Management Rx	Suitable	Alt A	Alt B	Alt D	Alt E	Alt F	Alt G	Alt I
0	N	2,090	1,123	833	833	0	77	1,929
1.A	N	118,041	118,059	118,041	117,960	118,242	117,960	117,436
1.B	N	7,559	17,982	16,123	32,512	0	55,856	8,094
2.A.1	N	5,998	5,998	5,998	5,998	5,998	5,998	5,998
2.A.2	N	468	468	468	468	468	468	468
2.A.3	N	1,551	1,551	1,551	1,551	1,551	1,551	1,551
2.B.1	N	5,660	5,660	5,660	5,660	0	5,660	2,120
2.B.2	N	1,135	1,215	3,625	1,026	0	1,695	524
2.B.3	N	5,101	2,362	5,101	5,101	0	5,101	423
3.A	N	7,122	7,122	7,122	7,122	7,116	7,122	7,122
3.C	N	23,676	23,736	23,736	23,662	23,470	23,662	23,660
3.D	N	2,450	2,450	2,450	2,450	0	2,450	2,029
4.A	N	14,313	14,313	14,313	14,313	5,646	14,313	16,655
4.C	N	430	0	430	430	0	430	0
4.D	N	440	0	0	0	1,326	297	3,363
4.E.1	N	0	0	0	0	46	0	191
4.F	N	10,842	1	2,392	45,902	0	61,151	18,129
4.F.1	Y	0	0	0	0	0	0	18,426
4.F.2	N	4,709	4,709	4,709	4,709	4,577	13,167	4,797
4.H	N	6,476	9,220	4,021	6,793	0	6,043	17,868
4.I	N	11,098	6,221	0	8,429	0	124,197	17,943

Chattahoochee Management Rx	Suitable	Alt A	Alt B	Alt D	Alt E	Alt F	Alt G	Alt I
4.J	Y	0	4,925	2,518	6,780	0	9,244	0
5.A	N	117	117	117	117	0	117	163
5.B	N	0	0	0	0	0	0	48
5.D	N	144	144	144	144	0	144	144
6.A	N	13,209	14,050	20,108	13,498	0	42,059	0
6.B	N	947	12,253	316	947	0	23,498	28,059
6.C	N	0	0	9,971	0	0	66,283	0
6.D	Y	13,467	0	14,713	0	0	3,478	598
6.E	N	0	0	0	16,508	0	7,338	0
7.A	Y	55,303	0	22,926	4,174	0	0	12,431
7.B	Y	21,097	0	10,162	31,463	16,614	0	16,586
7.C	Y	16,246	0	6,255	2,730	0	2,730	0
7.D	N	3,176	193	4,424	1,820	2,818	193	0
7.E.1	N	62,127	2,518	4,027	271,304	8,001	0	74,277
7.E.2	Y	0	0	0	0	0	0	22,455
8.A.1	Y	33,588	186,459	164	26,549	0	14,279	68,323
8.A.2	Y	9,945	62,403	15,353	4,374	0	85,668	23,693
8.B	Y	13,764	17,266	0	35,619	0	0	0
8.E.1	Y	0	2,556	0	0	0	0	0
8.E.3	Y	0	0	0	0	0	0	6,604
9.A.1	Y	8,294	8,294	8,295	8,294	0	8,294	9,325
9.A.3	Y	7,898	18,516	0	7,263	0	1,405	17,854
9.F	N	0	0	0	0	0	0	505
9.H	Y	3,034	197,725	13,465	1,002	0	30,026	172,718
10.A	Y	0	135	191,520	0	510,851	0	0
10.B	Y	198,479	0	138,337	6,815	0	0	0
10.E	Y	15,187	0	68,658	0	0	0	0
12.A	N	42,312	0	0	2,157	18,776	7,789	28,261
12.B	N	2,251	0	1,699	23,266	22,252	0	0
99-recently acquired or unallocated		0	0	0	0	3,018	0	0
TOTAL		749,744	749,744	749,745	749,743	*750,770	749,743	*750,770

Table B-41. Allocation of acres to various management prescriptions and their suitablity status for the Oconee National Forest.

Oconee Management Rx	Suitable	Alt A	Alt B	Alt D	Alt E	Alt F	Alt G	Alt I
0	N	0	0	0	0	0	0	142
2.B.2	N	5,276	3,850	10,806	2,850	0	7,337	4,854
3.B	N	4,638	4,638	4,638	4,638	4,638	4,638	9,364
4.B	N	1,005	1,005	1,005	1,005	0	1,005	0
4.B.1	N	0	0	0	0	1,007	0	1,005
4.D	N	346	25	25	25	232	346	1,215
4.E.1	N	353	1,152	353	267	70	521	111
4.G.1	N	4,959	4,959	4,959	4,959	5,372	4,959	0
4.H	N	5,530	6,956	0	6,956	0	3,469	4,730
4.I	N	0	844	0	844	0	2,390	0
5.A	N	101	101	101	101	0	101	102
6.A	N	0	0	0	2,604	0	6,040	0
6.B	N	0	0	0	0	0	0	1,617
7.B	Y	0	0	0	0	936	0	0
7.C	Y	1,978	0	0	0	0	0	0
7.D	N	1,530	1,530	1,438	712	202	2,766	0
7.E.1	N	0	0	0	8,165	0	5,526	985
7.E.2	Y	5	5	5	5	0	5	8,383
8.A.1	Y	0	0	0	2,622	0	0	0
8.A.2	Y	0	0	0	0	0	8,153	0
8.B.1	Y	0	0	0	11,026	0	0	0
8.D	Y	30,154	30,154	30,743	30,154	0	30,154	31,438
8.D.1	Y	15,922	15,874	15,922	15,874	14,394	15,922	15,670
9.F	N	0	0	0	0	0	0	593
9.G	Y	26,082	25,946	26,671	21,403	0	21,878	0
9.H	Y	0	18,171	0	0	0	0	35,006
10.A	Y	17,331	0	18,544	0	82,429	0	0
99 -recently acquired or unallocated		0	0	0	0	5,930	0	0
TOTAL		115,210	115,210	115,210	114,210	115,210	115,210	115,215

Table B-42. Allocation of acres by alternative.

Chattahoochee	Alt. A	Alt. B	Alt. D	Alt. E	Alt. F	Alt. G	Alt. I
Total Forested	749,744	749,744	749,745	749,743	750,770	749,743	750,770
Tentatively Suitable	589,313	589,313	589,313	589,313	589,313	589,313	589,313
Allocated to Suitable Rx	388,007	489,985	484,070	126,771	535,466	146,830	367,196
*Percent of Forest	52%	65%	65%	17%	71%	20%	49%
	Alt. A	Alt. B	Alt. D	Alt. E	Alt. F	Alt. G	Alt. I
Total Forested	115,210	115,210	115,210	114,210	115,210	115,210	115,215
Tentatively Suitable	107,326	107,326	107,326	107,326	107,326	107,326	107,326
Allocated to Suitable Rx	91,472	90,150	91,885	81,084	97,759	76,112	93,902
*Percent of Forest	79%	78%	80%	70%	85%	66%	81%
	Alt. A	Alt. B	Alt. D	Alt. E	Alt. F	Alt. G	Alt. I
Total Forested	864,954	864,954	864,955	863,953	865,980	864,953	865,985
Tentatively Suitable	696,639	696,639	696,639	696,639	696,639	696,639	696,639
Allocated to Suitable Rx	479,479	580,135	575,955	207,855	633,225	222,942	461,098
*Percent of Forest	55%	67%	67%	24%	73%	26%	53%

* Percent of forested acres that were allocated to a suitable Rx.

RECREATION

ROS CLASS ESTIMATES

EXISTING SITUATION

At the time the DEIS and FEIS analyses were done no nationally standardized GIS analysis tool was available to generate estimates of the Recreation Opportunity Spectrum (ROS) settings. The 1985 Plan had generated these estimates, probably by laborious quad-by-quad mapping on paper 1:24000 scale topographic maps. That information was valuable context but ROS is heavily driven by distance from roads. Roads constructed since the adoption of the 1985 plan by the Forest Service, state or county roads built through Forest Service, land acquisitions, land divestitures, Congressional designations, and the management (open or closed) of any new Forest Service roads are all variables that have affected that estimate since it was first generated.

As the draft was in preparation, it appeared that there would be a standard national process for generating ROS estimates through GIS in time for the final. However, that did not happen.

Between the Draft and Final we used GIS to derive a relatively coarse ROS estimate. We buffered roads by the distances specified in the ROS definitions and also checked for areas large enough to meet size criteria of each of the Primitive and Semi-primitive definitions. The criteria were carefully constructed to be a 'nested' set such that no land was unaccounted for but no area was double-counted due to an overlap in criteria.

Several results immediately became apparent. Only the Blue Ridge Mountains had any potential for a Primitive setting because it requires a 3-mile distance from an open road and a minimum size of 5,500 acres. But analysis showed there were no acres in the Blue Ridge Mountains meeting the criteria. Further, the ability of the Forest Service, within our jurisdiction, to create Primitive by road closure or obliteration is physically very limited. Where the possibility does exist, the closure of major through roads would be required and would be a major negative effect to hunting, fishing, hiking, driving for pleasure, access to developed campgrounds, and access to private in-holdings. We concluded that having acreage in Primitive **inventory** as meeting the physical criteria was impracticable in all alternatives.

In addition, we found that provision of the Semi-primitive **inventory** setting on either the Oconee or the Armuchee Ranger Districts was similarly infeasible. The NF ownership pattern along with terrain and access patterns coupled with Forest Service jurisdiction effectively eliminated the possibility of achieving the minimum size criteria.

Once an initial existing conditions estimate of acres by ROS class was generated in GIS, it was reviewed, proofed, and refined by Recreation Staff and re-run. Each stand of the stands data layer was attributed with the estimated ROS class. This estimate was then considered synonymous with Alternative F and the existing condition.

HOW ALTERNATIVES WOULD CHANGE

The next step was to quantify how alternatives would change the existing situation. The basis for doing this was an 'assigned' (that is, 'desired') ROS class or ROS classes for each management prescription. This crosswalk was developed by the SARRWAG Team, headed at the Regional Office and involving Recreation Staff on each Forest in revision.

A separate spreadsheet was made for each alternative. A systematic, step-by-step analysis was the done as follows:

1. A GIS analysis of the acres by alternative, management prescription and estimated existing ROS class was run as a starting point. This data was entered in a blank spreadsheet as a first set of columns.

2. The SARRWAG crosswalk table was entered as a second set of columns with an "X" entry at the intersection of each management prescription row and ROS setting column they had identified as appropriate. This was the 'template' to move acres into SARRWAG assigned ROS classes.

In October 2002, the Chattahoochee–Oconee National Forests generated a GIS model to estimate distribution of ROS classes by management prescriptions. These ROS settings were then compared to the assigned Southern Appalachian Recreation Rivers and Advisory Group (SARWAG) ROS settings. There were differences between assigned ROS settings and the Forest ROS generated settings.

The table that follows outlines the SARRWAG assigned distribution of ROS settings by management prescription. In the realm of consistency, SARRWAG distribution of ROS setting was used. This table indicates the changes initiated to meet consistency in each management prescription.

Table B-43. Management Prescriptions with GIS Model Settings and SARRWAG Assigned ROS Settings

Management Prescription	Description	Forest GIS ROS Setting Used 1st Before				SARRWAG ROS Setting Used 2nd After			
			SPNM	SPM	RN	P	SPNM	SPM	RN
0	Custodial Mgt.		X		X		X		X
1.A	Designated Wilderness		X	X	X	X	X		
1.B	Recommended Wilderness Study Areas		X	X	X	X	X		
2.A.1	Designated Wild Rivers		X		X		X		
2.A.2	Designated Scenic Rivers		X		X		X	X	X
2.A.	Designated Recreational Rivers		X		X		X	X	X
2.B.1	Recommended Wild Rivers		X	X	X		X		
2.B.2	Recommended Scenic Rivers		X		X		X	X	X
2.B.3	Recommended Recreational Rivers		X	X	X		X	X	X
3.A	Natural Scenic Areas		X	X	X		X	X	X
3.B	Experimental Forests				X				
3.C	National Recreation Areas		X	X	X		X		X
3.D	Proposed National Recreation Areas		X	X	X				
4.A	Appalachian Trail Corridor		X		X		X		X
4.B.1	Murder Cr. Research Natural Area			X	X	X	X		
4.C	Geologic Paleontologic				X				
4.D	Botanical Zoological		X		X		X	X	X
4.E.1	Cultural Heritage				X		X		X
4.F	Scenic and Wildlife Mgt Areas		X	X	X		X	X	X
4.F.2	Regional Forester Scenic Areas		X		X		X	X	X
4.G.1	Experimental Demonstration Areas			X	X				X
4.H	Outstandingly Remarkable Streams		X		X		X		X
4.I	Natural Areas - Few Open Roads		X	X	X		X	X	X
5.A	Administrative Sites		X		X				
5.B	Communications Sites		X		X				
5.D	Military Use Areas				X				X
6.A	Old Growth Natural Process Areas		X	X	X		X		X
6.B	Areas Managed to Restore/Maintain Old Growth Characteristics		X		X				X
6.D	Areas Managed to Restore Old Growth Characteristics		X		X				X
6.E	Old Growth Core Areas Surrounded by Uneven-aged Mgt.		X	X	X				X
7.A	Scenic Hwy. Corridors		X	X	X				X

Table continued next page

Management Prescription	Description	Forest GIS ROS Setting Used 1st Before				SARRWAG ROS Setting Used 2nd After			
			SPNM	SPM	RN	P	SPNM	SPM	RN
7.B	Scenic Corridors and Sensitive Viewsheds		X		X			X	X
7.C	OHV Use Areas		X	X	X				
7.D	Concentrated Recreation Zones		X	X	X		X	X	X
7.E.1	Dispersed Recreation Areas		X	X	X		X	X	X
7.E.2	Dispersed Recreation Areas w/Vegetation Mgt.				X				
8.A.1	Mid-to-Late –Successional Forest Emphasis		X	X	X				X
8.A.2	Areas Sensitive Mid-Late Successional Forest Emphasis		X		X				X
8.B	Early-Successional Habitat Emphasis		X	X	X				X
8.D	Red-Cockaded Woodpecker Habitat Mgt. Area			X	X				X
8.D.1	Red-Cockaded woodpecker Sub-habitat Mgt. Areas			X	X				X
8.E.3	High Elevation Early Successional Habitat		X	X	X				
9.A.1	Source Water Protection Watersheds		X		X				
9.A.3	Watershed Restoration Areas		X		X				
9.G	Restoration			X	X				X
9.H	Mgt.,Mtnce., and Restoration of Plant Associations		X		X		X		X
10.A	Sustained Yield Timber Mgt.		X	X	X				X
10.B	High Quality Forest Products Emphasis		X	X	X				X
10.E	Timber Mgt. With Recreation Emphasis		X	X	X				
12.A	Remote Backcountry Recreation –Few Open Roads		X	X	X				
12.B	Remote Backcountry Recreation –Non-motorized		X		X				

From the above table, there is some difference between the Forest GIS model ROS settings and the SARRWAG generated ROS settings. Where the SAARWAG ROS data is not assigned to the management prescriptions, the Forest-developed ROS setting were implemented.

3. For each management prescription, the existing setting was systematically compared to the SARRWAG assigned settings. If existing acres were all within an assigned setting, no change was made. If existing settings were not within assigned settings, the acres in the 'non-conforming' setting were moved as a positive number into a third set of columns of ROS classes. And the ROS class from which the acres were moved was attributed with a corresponding negative number. The general rule in making this change was to move acres into the ROS class most like the existing condition. This is a matter of practicality in that movement by management change into an adjacent class is much more likely to be possible that movement two or more classes away. Two additional constrains applied here however; (a) no acres were moved into Primitive as already explained, and (b) no acres were moved into Urban or Rural as these are not compatible with National Forest mission and objectives.

4. The acres were balanced prescription by prescription to be sure the math was correct and there was no double count.

A fourth set of columns was created to receive the sum of (a) the existing acres by ROS class, plus (b) the positive or negative change to that class created by the desired conditions of management prescription allocations.

Once all rows had been filled out and balanced, the last set of columns was summed for acres by ROS class for each alternative.

The result was a comparison of recreation emphasis of each alternative. It is critical to understand that the process described was used as a way to evaluate alternatives. As described for the Primitive setting, we may not actually be able to create an ROS inventory that replicates the results of this analysis. But we can and do manage land as if it were in the desired ROS class. For example, we can manage Wilderness as if it were Primitive for those features that are within management control such as the type of facilities permitted, types of materials used, numbers of visitors, and so on.

Some prescriptions were matched with two or more ROS classes, necessitating either the selection of one or the proportioning on some basis between the ones indicated.

Table B-44. Acres by Management Prescription by ROS Setting Chattahoochee National Forest-Alternative A

Alt A Mgt Rx	Roads Option	GIS ROS Setting			Total-GIS	SARRWAG ROS setting				Assigned acreage changes			New totals			total
		RN	SPM	SPNM		P	SPNM	SPM	RN	RN	SPM	SPNM	RN	SPM	SPNM	
0	3	535	0	1,089	1,625		X		X	0	0	0	535	0	1,089	1,624
1.A	1	33,714	495	83,838	118,047	X	X			-33,714	-495	34,210	0	0	118,047	118,047
1.B	1	5,391	26	2,142	7,559	X	X			-5,391	-26	5,417	0	0	7,559	7,559
2.A.1	2	2,719	0	3,279	5,998		X			-2,719	0	2,719	0	0	5,998	5,998
2.A.2	2	451	0	17	467		X	X	X	0	0	0	451	0	17	468
2.A.3	2	1,422	0	128	1,550		X	X	X	0	0	0	1,422	0	128	1,550
2.B.1	1	4,878	73	708	5,659		X			-4,878	-73	4,951	0	0	5,659	5,659
2.B.2	3	1,289	0	1	1,291		X	X	X	0	0	0	1,289	0	1	1,290
2.B.3	3	4,998	63	42	5,103		X	X	X	0	0	0	4,998	63	42	5,103
3.A	3	6,476	399	246	7,122		X	X	X	0	0	0	6,476	399	246	7,121
3.C	3	17,178	3,024	3,433	23,636		X		X	0	-3,024	3,024	17,178	0	6,457	23,636
3.D	3	1,800	146	503	2,449		X		X	0	-146	146	1,800	0	649	2,449
4.A	2	11,149	0	2,802	13,951		X		X	0	0	0	11,149	0	2,802	13,951
4.C	2	430	0	0	430					0	0	0	430	0	0	
4.D	1	311	0	130	440		X	X	X	0	0	0	311	0	130	441
4.E.1	2	46	0	0	46		X		X	0	0	0	46	0	0	46
4.F	2	9,917	9	912	10,838		X	X	X	0	0	0	9,917	9	912	10,838
4.F.2	2	3,823	0	886	4,709		X	X	X	0	0	0	3,823	0	886	4,709
4.H	3	5,840	0	832	6,672		X		X	0	0	0	5,840	0	832	6,672
4.I	1	9,416	164	1,519	11,099		X	X	X	0	0	0	9,416	164	1,519	11,099
5.A	4	97	0	19	116				X	19	0	-19	116	0	0	116
5.D	3	144	0	0	144				X	0	0	0	144	0	0	144
6.A	1	12,251	108	850	13,209		X		X	0	-108	108	12,251	0	958	13,209
6.B	3	706	0	241	947				X	241	0	-241	947	0	0	947

Table continued next page

Alt A Mgt Rx	Roads Option	GIS ROS Setting RN	SPM	SPNM	Total-GIS	SARRWAG ROS setting P	SPNM	SPM	RN	Assigned acreage changes RN	SPM	SPNM	New totals RN	SPM	SPNM	Reassigned total
6.D	2	9,967	0	3,354	13,321				X	3,354	0	-3,354	13,321	0	0	13,321
7.A	3	49,552	2,337	5,459	57,349				X	7,796	-2,337	-5,459	57,349	0	0	57,349
7.B	2	17,750	0	3,335	21,085			X	X	0	3,335	-3,335	17,750	3,335	0	21,085
7.C	3	16,089	2	156	16,247	DATA NOT AVAILABLE				0	0	0	16,089	2	156	16,247
7.D	2	2,551	192	433	3,176		X	X	X	0	0	0	2,551	192	433	3,176
7.E.1	2	50,691	134	11,300	62,124		X	X	X	0	0	0	50,691	134	11,300	62,124
8.A.1	3	28,231	364	4,788	33,382				X	5,151	-364	-4,788	33,382	0	0	33,382
8.A.2	2	8,050	0	1,895	9,944				X	1,895	0	-1,895	9,944	0	0	9,944
8.B	3	10,692	169	2,903	13,764				X	3,072	-169	-2,903	13,764	0	0	13,764
9.A.1	2	6,544	0	1,751	8,295	DATA NOT AVAILABLE				0	0	0	6,544	0	1,751	8,295
9.A.3	2	7,409	0	490	7,899	DATA NOT AVAILABLE				0	0	0	7,409	0	490	7,899
9.H	2	2,806	0	227	3,034		X		X	0	0	0	2,806	0	227	3,033
10.B	3	168,673	3,894	23,681	196,247				X	27,575	-3,894	-23,681	196,247	0	0	196,247
10.E	3	12,312	586	1,947	14,845	DATA NOT AVAILABLE				0	0	0	12,312	586	1,947	14,845
12.A	2	21,700	1,388	19,225	42,312	DATA NOT AVAILABLE				0	0	0	21,700	1,388	19,225	42,312
12.B	2	1,207	0	1,043	2,250	DATA NOT AVAILABLE				0	0	0	1,207	0	1,043	2,250
no data	n/a	1,885	0	738	2,622	DATA NOT AVAILABLE				0	0	0	1,885	0	738	2,623
					751,002								553490	6271	191240	751,001

Table B-45. Acres by Management Prescription by ROS Setting Chattahoochee National Forest-Alternative B

		GIS ROS Setting			Total GIS					Assigned Acreage Changes			New Totals			Reassigned Total
Alt B Mgt Rx	Roads Option	RN	SPM	SPNM		P	SPNM	SPM	RN	RN	SPM	SPNM	RN	SPM	SPNM	
0	3	740	0	383	1,122		X		X	0	0	0	740	0	383	1,123
1.A	1	33,714	495	83,855	118,065	X				-33,714	-495	34,209	0	0	118,065	118,065
1.B	1	10,731	26	7,225	17,981		X			-10,731	-26	10,757	0	0	17,982	17,982
2.A.1	2	2,719	0	3,279	5,998		X			-2,714	0	2,714	0	0	5,998	5,998
2.A.2	2	451	0	17	467		X	X	X	0	0	0	451	0	17	468
2.A.3	2	1,422	0	128	1,550		X	X	X	0	0	0	1,422	0	128	1,550
2.B.1	1	4,878	73	708	5,659		X			-4,878	-73	5,659	0	0	5,659	5,659
2.B.2	3	1,215	0	0	1,215		X	X	X	0	0	0	1,215	0	0	1,215
2.B.3	3	2,358	5	0	2,362		X	X	X	0	0	0	2,358	5	0	2,363
3.A	3	6,476	399	246	7,122		X	X	X	0	0	0	6,476	399	246	7,121
3.C	3	17,239	3,024	3,433	23,696		X		X	0	-3,024	3,024	17,239	0	6,457	23,696
3.D	3	1,800	146	503	2,450		X		X	0	-146	146	1,800	0	649	2,449
4.A	2	11,149	0	2,802	13,951		X		X	0	0	0	11,149	0	2,802	13,951
4.E.1	2	46	0	0	46		X	X		0	0	0	46	0	0	46
4.F.2	2	3,823	0	886	4,709		X	X	X	0	0	0	3,823	0	886	4,709
4.H	3	8,642	58	874	9,574		X	X	X	0	0	0	8,642	58	874	9,574
4.I	1	5,480	0	741	6,221	DATA NOT AVAILABLE				0	0	0	5,480	0	741	6,221
4.J	3	3,259	63	1,603	4,925	DATA NOT AVAILABLE				0	0	0	3,259	63	1,603	4,925
5.A	4	97	0	19	116				X	19	0	-19	116	0	0	116
5.D	3	144	0	0	144	DATA NOT AVAILABLE				0	0	0	144	0	0	144
6.A	1	9,749	508	3,329	13,585		X		X	0	-508	508	9,749	0	3,837	13,586
6.B	3	10,060	108	2,084	12,253				X	2,084	0	-2,084	12,144	108	0	12,252
7.A	3	2,037	0	0	2,037				X	0	0	0	2,037	0	0	2,037
7.D	2	193	0	0	193		X	X	X	0	0	0	193	0	0	193

Table continued next page

		GIS ROS Setting			Total GIS	SARRWAG ROS setting				Assigned Acreage Changes			New Totals			Reassigned Total
Alt B Mgt Rx	Roads Option	RN	SPM	SPNM		P	SPNM	SPM	RN	RN	SPM	SPNM	RN	SPM	SPNM	
7.E.1	2	2,514	0	5	2,518		X	X	X	0	0	0	2,514	0	5	
8.A.1	3	152,514	3,693	29,931	186,139				X	33,624	-3,693	-29,931	186,138	0	0	186,138
8.A.2	2	48,447	585	13,367	62,399				X	13,952	-585	-13,367	62,399	0	0	62,399
8.B	3	11,824	2,048	3,393	17,266				X	0	0	0	11,824	2,048	3,393	17,266
8.E.1	3	2,148	9	399	2,556	DATA NOT AVAILABLE				0	0	0	2,148	9	399	2,556
9.A.1	2	6,544	0	1,751	8,295	DATA NOT AVAILABLE				0	0	0	6,544	0	1,751	8,295
9.A.3	2	15,764	0	2,752	18,516		X		X	0	0	0	15,764	0	2,752	18,516
9.H	2	170,989	2,333	21,794	195,116	DATA NOT AVAILABLE				0	0	0	170,989	2,333	21,794	195,116
10.A	3	39	0	96	135				X	0	0	0	39	0	96	135
no data	n/a	1,885	0	738	2,622	DATA NOT AVAILABLE				0	0	0	1,885	0	738	2,622
					751,002								548727	5023	197255	751,004

Table B-46. Acres by Management Prescription by ROS Setting Chattahoochee National Forest-Alternative D

Alt D Mgt Rx	Roads Option	GIS ROS Setting			Total-GIS	SARRWAG ROS Setting				Assigned Acreage Changes			New Totals			Reassigned Total
		RN	SPM	SPNM		P	SPNM	SPM		RN	SPM	SPNM	RN	SPM	SPNM	
0	3	453	0	380	833		X		X	0	0	0	453	0	380	833
1.A	1	33,714	495	83,838	118,047	X				-33,714	-495	34,209	0	0	118,045	118,045
1.B	1	10,060	0	6,063	16,123		X			-10,060	0	10,060	0	0	16,123	16,123
2.A.1	2	2,719	0	3,279	5,998		X			-2,719	0	2,714	0	0	5,998	5,998
2.A.2	2	451	0	17	467		X	X	X	0	0	0	451	0	17	468
2.A.3	2	1,422	0	128	1,550		X	X	X	0	0	0	1,422	0	128	1,550
2.B.1	1	4,878	73	708	5,659		X			-4,878	-73	4,951	0	0	5,659	5,659
2.B.2	3	3,488	0	137	3,625		X	X	X	0	0	0	3,488	0	137	3,625
2.B.3	3	4,998	63	42	5,103		X	X	X	0	0	0	4,998	63	42	5,103
3.A	3	6,476	399	246	7,122		X	X	X	0	0	0	6,476	399	246	7,121
3.C	3	17,239	3,024	3,433	23,696		X		X	0	-3,024	3,024	17,239	0	6,457	23,696
3.D	3	1,800	146	503	2,450					0	-146	146	1,800	0	649	2,449
4.A	2	11,149	0	2,802	13,951		X		X	0	0	0	11,149	0	2,802	13,951
4.C	2	430	0	0	430					0	0	0	430	0	0	430
4.E.1	2	46	0	0	46		X		X	0	0	0	46	0	0	46
4.F	2	2,035	0	624	2,659		X	X	X	0	0	0	2,035	0	624	2,659
4.F.2	2	3,823	0	886	4,709		X	X	X	0	0	0	3,823	0	886	4,709
4.H	3	3,325	0	695	4,020		X		X	0	0	0	3,325	0	695	4,020
4.J	3	644	0	1,873	2,518					0	0	0	644	0	1,873	2,518
5.A	4	97	0	19	116				X	19	0	-19	116	0	0	116
5.D	3	144	0	0	144					0	0	0	144	0	0	144
6.A	1	8,918	83	10,642	19,642		X		X	0	-83	83	8,918	0	10,725	19,643
6.B	3	287	0	29	316				X	29	0	-29	316	0	0	316

Table continued next page

Alt D Mgt Rx	Roads Option	GIS ROS Setting RN	SPM	SPNM	Total-GIS	SARRWAG ROS Setting P	SPNM	SPM	RN	Assigned Acreage Changes RN	SPM	SPNM	New Totals RN	SPM	SPNM	Reassigned Total
6.C	1	7,140	217	2,613	9,970				X	0	0	0	7,140	217	2,613	9,970
6.D	2	13,085	129	1,497	14,712				X	1,626	-129	-1,497	14,711	0	0	14,711
7.A	3	20,751	867	3,345	24,963				X	0	0	0	20,751	867	3,345	24,963
7.B	2	7,892	63	2,292	10,247			X	X	0	2,292	-2,292	7,892	2,355	0	10,247
7.C	3	5,879	0	376	6,255	DATA NOT AVAILABLE				0	0	0	5,879	0	376	6,255
7.D	2	4,370	9	46	4,424		X	X	X	0	0	0	4,370	9	46	4,424
7.E.1	2	3,322	0	704	4,026		X	X	X	0	0	0	3,322	0	704	4,026
8.A.1	3	64	0	100	164				X	100	0	-100	164	0	0	164
8.A.2	2	7,683	0	7,670	15,353				X	7,670	0	-7,670	15,353	0	0	15,353
9.A.1	2	6,545	0	1,751	8,295					0	0	0	6,545	0	1,751	8,295
9.H	2	12,207	8	1,120	13,335		X		X	0	0	0	12,207	8	1,120	13,335
10.A	3	159,501	4,085	27,310	190,895					0	0	0	159,501	4,085	27,310	190,895
10.B	3	123,694	721	11,742	136,157				X	12,463	-721	-11,742	136,157	0	0	136,157
10.E	3	57,730	3,190	7,741	68,660	DATA NOT AVAILABLE				0	0	0	57,730	3,190	7,741	68,660
12.B	2	747	0	953	1,699	DATA NOT AVAILABLE				0	0	0	747	0	953	1,699
no data	n/a	1,885	0	738	2,622	DATA NOT AVAILABLE				0	0	0	1,885	0	738	2,622
					751,003								521625	11193	218,181	750,999

Table B-47. Acres by Management Prescription by ROS Setting Chattahoochee National Forest-Alternative E

Alt E Mgt Rx	Roads Option	GIS ROS Setting			Total-GIS	SARRWAG ROS Setting				Assigned Acreage Changes			New Totals			Reassigned Total
		RN	SPM	SPNM		P	SPNM	SPM	RN	RN	SPM	SPNM	RN	SPM	SPNM	
0	3	453	0	380	833		X		X	0	0	0	453	0	380	833
1.A	1	33,633	495	83,838	117,966	X				-33,633	-495	34,128	0	0	117,966	117966
1.B	1	17,148	811	14,552	32,512		X			-17,148	-811	17,959	0	0	32,512	32512
2.A.1	2	2,719	0	3,279	5,998		X			-2,719	0	2,719	0	0	5,998	5998
2.A.2	2	451	0	17	467		X	X	X	0	0	0	451	0	17	467
2.A.3	2	1,422	0	128	1,550		X	X	X	0	0	0	1,422	0	128	1550
2.B.1	1	4,878	73	0	4,951		X			-4,878	-73	4,951	0	0	4,951	4951
2.B.2	3	994	0	32	1,026		X	X	X	0	0	0	994	0	32	1026
2.B.3	3	4,998	63	42	5,103		X	X	X	0	0	0	4,998	63	42	5103
3.A	3	6,476	399	246	7,122		X	X	X	0	0	0	6,476	399	246	7122
3.C	3	17,164	3,024	3,433	23,621		X		X	0	-3,024	3,024	17,164	0	6,457	23621
3.D	3	1,800	146	503	2,450					0	-146	146	1800	0	649	2449
4.A	2	11,149	0	2,802	13,951		X		X	0	0	0	11,149	0	2,802	13951
4.C	2	430	0	0	430				X	0	0	0	430	0	0	
4.E.1	2	46	0	0	46		X	X	X	0	0	0	46	0	0	46
4.F	2	39,560	710	5,981	46,251		X		X	0	0	0	39,560	710	5,981	46251
4.F.2	2	3,823	0	886	4,709		X	X	X	0	0	0	3,823	0	886	4709
4.H	3	5,960	0	832	6,792		X		X	0	0	0	5,960	0	832	6792
4.I	1	7,101	0	1,327	8,429					0	0	0	7,101	0	1,327	8429
4.J	3	5,560	0	1,220	6,780	DATA NOT AVAILABLE				0	0	0	5,560	0	1,220	6780
5.A	4	97	0	19	116				X	19	0	-19	116	0	0	116
5.D	3	144	0	0	144				X	0	0	0	144	0	0	144
6.A	1	10,460	357	2,681	13,498		X		X	0	-357	3,038	10,460	0	3,038	13498

Table continued next page.

Alt E Mgt Rx	Roads Option	GIS ROS Setting RN	SPM	SPNM	Total-GIS	SARRWAG ROS Setting P	SPNM	SPM	RN	Assigned Acreage Changes RN	SPM	SPNM	New Totals RN	SPM	SPNM	Reassigned Total
6.B	3	706	0	241	947				X	241	0	-241	947	0	0	947
6.E	2	14,259	108	2,058	16,425				X	2,166	-108	-2,058	16,425	0	0	16425
7.A	3	5,789	0	422	6,211				X	0	0	0	5,789	0	422	6211
7.B	2	26,295	1,416	3,761	31,473		X	X	X	0	0	0	26,295	1,416	3,761	31473
7.C	3	2,726	0	5	2,731	DATA NOT AVAILABLE				0	0	0	2,726	0	5	2731
7.D	2	1,580	0	240	1,820		X	X	X	0	0	0	1,580	0	240	1820
7.E.1	2	226,440	4,846	36,751	268,037		X	X	X	0	0	0	226,440	4,846	36,751	268037
8.A.1	3	23,286	0	3,202	26,489				X	3,202	0	-3,202	26,489	0	0	26489
8.A.2	2	3,463	0	911	4,373				X	91	0	-911	4,373	0	0	4373
8.B	3	32,374	185	3,061	35,620				X	4,246	-185	-3,061	35,620	0	0	35620
9.A.1	2	6,544	0	1,751	8,295	DATA NOT AVAILABLE				0	0	0	6,544	0	1,751	8295
9.A.3	2	6,200	0	1,063	7,263	DATA NOT AVAILABLE				0	0	0	6,200	0	1,063	7263
9.H	2	948	0	54	1,002		X		X	0	0	0	948	0	54	1002
10.B	3	5,817	162	838	6,818				X	1,000	-162	-838	6,818	0	0	6818
12.A	2	2,137	0	20	2,157	DATA NOT AVAILABLE				0	0	0	2,137	0	20	2157
12.B	2	14,172	776	8,317	23,266	DATA NOT AVAILABLE				0	0	0	14,172	776	8,317	23266
no data	n/a	1,885	0	738	2,622	DATA NOT AVAILABLE				0	0	0	1,885	0	738	2622
					750,295								503497	8210	238,586	750293

Table B-48. Acres by Management Prescription by ROS Setting Chattahoochee National Forest- Alternative F

		GIS ROS Setting			Total-GIS	SARRWAG ROS Setting				Assigned Acreage Changes			New Totals			Reassigned Total
Alt F Mgt Rx	Roads Option	RN	SPM	SPNM		P	SPNM	SPM	RN	RN	SPM	SPNM	RN	SPM	SPNM	
1.A	1	33,898	495	83,855	118,248	X	X			-33,898	-495	34,394	0	0	118,248	118,248
2.A	n/a	254	0	98	352	DATA NOT AVAILABLE				0	0	0	254	0	98	352
2.A.1	2	2,719	0	3,279	5,998		X			-2,719	0	2,719	0	0	5,998	5,998
2.A.2	2	451	0	17	467		X	X	X	0	0	0	451	0	17	468
2.A.3	2	1,422	0	128	1,550		X	X	X	0	0	0	1,422	0	128	1,550
3.A	3	6,471	399	246	7,116		X	X	X	0	0	0	6,471	399	246	7,116
3.C	3	16,972	3,024	3,433	23,430		X		X	0	-3,024	3,024	16,972	0	6,458	23,430
4.A	2	4,887	0	753	5,640		X		X	0	0	0	4,887	0	753	5,640
4.D	1	1,160	0	165	1,326		X	X	X	0	0	0	1,160	0	165	1,325
4.E.1	2	46	0	0	46		X	X	X	0	0	0	46	0	0	46
4.F.2	2	3,688	0	888	4,577		X	X	X	0	0	0	3,688	0	888	4,576
7.B	2	12,764	86	3,764	16,614			X	X	0	3,764	-3,764	12,764	3,850		16,614
7.D	2	2,716	78	26	2,820	DATA NOT AVAILABLE				0	0	0	2,716	78	26	2,820
7.E.2	3	7,618	6	376	8,000	DATA NOT AVAILABLE				0	0	0	7,618	6	376	8,000
10.A	3	432,918	7,150	69,235	509,303				X	0	0	0	432,918	7,150	69,235	509,303
12.A	2	12,142	134	6,500	18,776	DATA NOT AVAILABLE				0	0	0	12,142	134	6,500	18,776
12.B	2	7,541	2,200	12,510	22,251	DATA NOT AVAILABLE				0	0	0	7,541	2,200	12,510	22,251
99	n/a	3,776	0	1,066	4,842	DATA NOT AVAILABLE				0	0	0	3,776	0	1,066	4,842
					751,357								514826	13817	222,712	751,355

Table B-49. Acres by Management Prescription by ROS Setting Chattahoochee National Forest –Alternative G

Alt G Mgt Rx	Roads Option	GIS ROS Setting RN	SPM	SPNM	GIS	SARRWAG ROS Setting P	SPNM	SPM	RN	Assigned Acreage Changes RN	SPM	SPNM	New Totals RN	SPM	SPNM	Reassigned Total
0	3	51	0	27	77		X		X	0	0	0	51	0	27	78
1.A	1	33633	495	83838	117966	X				-33,633	-495	34,128	0	0	117,966	117966
1.B	1	31365	1588	22903	55856		X			-31,365	-1588	32,953	0	0	55,856	55856
2.A.1	2	2719	0	3279	5998		X			-2,719	0	2,719	0	0	5,998	5998
2.A.2	2	451	0	17	467		X	X	X	0	0	0	451	0	17	467
2.A.3	2	1422	0	128	1550		X	X	X	0	0	0	1422	0	128	1550
2.B.1	1	4878	73	708	5659		X			-4,878	-73	5,659	0	0	5,659	5659
2.B.2	3	1558	0	137	1695		X	X	X	0	0	0	1558	0	137	1695
2.B.3	3	4998	63	42	5103		X	X	X	0	0	0	4998	63	42	5103
3.A	3	6476	399	246	7122				X	0	0	0	6476	399	246	7122
3.C	3	17164	3024	3433	23621		X	X	X	0	-3,024	3,024	17,164	0	6,457	23621
3.D	3	1800	146	503	2450					0	-146	146	1,800	0	649	2449
4.A	2	11149	0	2802	13951		X		X	0	0	0	11,149	0	2,802	13951
4.C	2	430	0	0	430					0	0	0	430	0	0	430
4.D	1	31	0	267	297				X	0	0	0	31	0	267	
4.E.1	2	46	0	0	46		X	X	X	0	0	0	46	0	0	46
4.F	2	53739	1855	5557	61150		X		X	0	0	0	53739	1855	5557	61150
4.F.2	2	11279	37	1848	13164		X	X	X	0	0	0	11279	37	1848	13164
4.H	3	5348	0	695	6043		X		X	0	0	0	5348	0	695	6043
4.I	1	102014	3886	18620	124520	DATA NOT AVAILABLE				0	0	0	102014	3886	18620	124520
4.J	3	7069	63	2112	9245	DATA NOT AVAILABLE				0	0	0	7069	63	2112	9245
5.A	4	97	0	19	116				X	19	0	-19	116	0	19	135
5.D	3	144	0	0	144				X	0	0		144	0	0	144
6.A	1	28018	1096	11833	40948		X		X	0	-1,096	1,096	28,108	0	12,929	41037

Table continued next page.

Alt G Mgt Rx	Roads Option	GIS ROS Setting RN	SPM	SPNM	GIS	SARRWAG ROS Setting P	SPNM	SPM	RN	New Totals RN	SPM	SPNM	RN	SPNM		Reassigned Total
6.B	3	21544	33	1860	23437				X	1,860	33	-1,860	23,404	33	0	23437
6.C	1	57966	127	8187	66280	DATA NOT AVAILABLE				0	0	0	57966	127	8187	66280
6.D	2	2573	0	905	3478				X	905	0	-905	3478	0	0	3478
6.E	2	6256	108	89	6453				X	197	-108	-89	6453	0	0	6453
7.A	3	2037	0	0	2037				X	0	0	0	2037	0	0	2037
7.C	3	2726	0	5	2731	DATA NOT AVAILABLE				0	0	0	2726	0	5	2731
7.D	2	193	0	0	193		X	X	X	0	0	0	193	0	0	193
8.A.1	3	10847	0	3275	14122				X	3,275	0	-3,275	14,122	0	0	14122
8.A.2	2	75075	357	9087	84518				X	9,444	-357	-9087	84519	0	0	84519
9.A.1	2	6544	0	1751	8295	DATA NOT AVAILABLE				0	0	0	6544	0	1751	8295
9.A.3	2	1392	0	14	1405	DATA NOT AVAILABLE				0	0	0	1392	0	14	1405
9.H	2	29313	222	489	30024		X			0	0	0	29313	222	489	30024
12.A	2	6862	0	926	7789	DATA NOT AVAILABLE				0	0	0	6862	0	926	7789
no data	n/a	1885	0	738	2622	DATA NOT AVAILABLE				0	0	0	1885	0	738	2622
					751003								494285	6685	250141.5	751112

Table B-50. Acres by Management Prescription by ROS Setting Chattahoochee National Forest-Alternative I_M

Alt I_m Mgt Rx	Roads Option	GIS ROS Setting RN	SPM	SPNM	Total-GIS	SARRWAG ROS Setting P	SPNM	SPM	RN	Assigned Acreage Changes RN	SPM	SPNM	New Totals RN	SPM	SPNM	Reassigned Total
0	3	715	0	1,214	1,929		X		X	0	0	0	715	0	1,214	1929
1.A	1	33,391	495	83,543	117,429	X				-33,391	-495	33,886	0	0	117,429	117429
1.B	1	5,680	31	2,384	8,094		X			-5,680	-31	5,71	0	31	8,095	8126
2.A.1	2	2,719	0	3,279	5,998		X			-2,719	0	2,719	0	0	5,998	5998
2.A.2	2	451	0	17	467		X	X	X	0	0	0	451	0	17	467
2.A.3	2	1,422	0	128	1,550		X	X	X	0	0	0	1,422	0	128	1550
2.B.1	1	1,616	73	430	2119		X			-1,616	-73	1,689	0	0	2,119	2119
2.B.2	3	523	0	0	523		X	X	X	0	0	0	523	0	0	523
2.B.3	3	418	5	0	423		X	X	X	0	0	0	418	5	0	423
3.A	3	6476	399	246	7121		X	X	X	0	0	0	6476	399	246	7121
3.C	3	17,202	3,024	3,433	23,660		X			17,202	-3,024	3,024	17,202	0	6,458	23660
3.D	3	1411	146	472	2029					0	-146	146	1,411	0	618	2029
4.A	2	13,157	0	3,488	16,645		X		X	0	0	0	13,157	0	3,488	16645
4.D	1	2,977	0	386	3,363				X	0	0	0	2,977	0	386	3363
4.E.1	2	191	0	0	191				X	0	0	0	191	0	0	191
4.F	2	14,168	21	3,940	18,129		X		X	0	0	0	14,168	21	3,940	18129
4.F.1	3	15,484	871	2,072	18,426		X	X	X	0	0	0	15,484	871	2,072	18426
4.F.2	2	3,911	0	886	4,797		X	X	X	0	0	0	3,911	0	886	4797
4.H	3	16,511	58	1,300	17,869		X	X	X	0	0	0	16,511	58	1,300	17869
4.I	1	14,054	108	3,781	17,943	DATA NOT AVAILABLE				0	0	0	14,054	108	3,781	17943
5.A	4	143	0	19	162				X	19	0	-19	162	0	0	162
5.B	4	38	0	10	48	DATA NOT AVAILABLE				0	0	0	38	0	10	48
5.D	3	144	0	0	144				X	0	0	0	144	0	0	144
6.B	3	23,416	33	4,608	28,057				X	4,608	0	-4,608	28,024	33	0	28057
6.D	2	582	0	16	598				X	16	0	-16	598	0	0	598
7.A	3	12,045	0	385	12,430				X	385	0	-385	12,430	0	0	12430

Table continued next page.

Alt I_m Mgt Rx	Roads Option	GIS ROS Setting RN	SPM	SPNM	Total-GIS	SARRWAG ROS Setting P	SPNM	SPM	RN	Assigned Acreage Changes RN	SPM	SPNM	New Totals RN	SPM	SPNM	Reassigned Total
7.B	2	15,810	12	821	16,643	DATA NOT AVAILABLE				0	0	0	15,810	12	821	16643
7.E.1	2	52,958	4,652	16,751	74,361		X	X	X	0	0	0	52,958	4,652	16,751	74361
7.E.2	3	20,074	156	2,332	22,562	DATA NOT AVAILABLE				0	0	0	20,074	156	2,332	22562
8.A.1	3	58,133	1,490	8,700	68,323				X	10,190	-1,490	-8,700	68,323	0	0	68323
8.A.2	2	20,564	141	2,988	23,692				X	3,129	-141	-2,988	23,693	0	0	23693
8.E.3	3	5,306	9	1,289	6,604				X	0	0	0	5,306	9	1,289	6604
9.A.1	2	7,524	0	1,802	9,326	DATA NOT AVAILABLE				0	0	0	7,524	0	1,802	9326
9.A.3	2	15,191	0	2,663	17,854	DATA NOT AVAILABLE				0	0	0	15,191	0	2,663	17854
9.F	1	497	0	8	505	DATA NOT AVAILABLE				0	0	0	497	0	8	505
9.H	2	154,495	1,229	17,002	172,726		X		X	0	0	0	154,495	1,229	17,002	172726
12.A	2	11,692	621	15,947	28,259	DATA NOT AVAILABLE				0	0	0	11,692	621	15,947	28259
					751,000								526029	8204	216,798	751031

Table B-51. Acres by Management Prescription by ROS Setting Oconee National Forest-Alternative A

		GIS ROS Setting			Total-GIS	SARRWAG ROS Setting				Assigned Acreage Changes			New Totals			Reassigned Total
Alt A Mgt Rx	Roads Option	RN	SPM	SPNM		P	SPNM	SPM	RN		SPM	SPNM	RN	SPM	SPNM	
0	3	3	0	0	3		X		X	0	0	0	3	0	0	3
2.B.2	3	4,701	572	0	5,274		X	X	X	0	0	0	4,701	572	0	5,274
3.B	2	4,638	0	0	4,638				X	0	0	0	4,638	0	0	4,638
4.B.1	1	819	185	0	1,004	X	X			-819	-185	1,004	0	0	1,004	1,004
4.D	1	249	96	0	344		X	X	X	0	0	0	249	96	0	344
4.E.1	2	54	42	0	96		X	X	X	0	0	0	54	42	0	96
4.G.1	3	5,155	57	0	5,212				X	0	-57	57	5,212	0	0	5,212
4.H	3	4,510	1,017	0	5,527		X	X	X	0	0	0	4,510	1,017	0	5,527
5.A	4	101	0	0	101				X	0	0	0	101	0	0	101
7.C	3	1,980	0	0	1,980	NO DATA AVAILABLE				0	0	0	1,980	0	0	1,980
7.D	2	1,505	28	0	1,533		X	X	X	0	0	0	1,505	28	0	1,533
7.E.2	3	5	0	0	5		X	X	X	0	0	0	5	0	0	5
8.D	3	28,976	1,192	0	30,169				X	1,192	-1,192	0	30,169	0	0	30,169
8.D.1	3	15,746	182	0	15,928				X	182	-182	0	15,928	0	0	15,928
9.G	2	24,386	1,689	0	26,075				X	1,689	-1,689	0	26,075	0	0	26,075
10.A	3	16,988	345	0	17,333				X	345	-345	0	17,333	0	0	17,333
				TOTAL	115,221								112462	1755	1004	115,221

Table B-52. Acres by Management Prescription by ROS Setting Oconeee National Forest-Alternative B

		GIS ROS Setting			Total-GIS	SARRWAG ROS Setting				Assigned Acreage Changes			New Totals			Reassigned Total
Alt B Mgt Rx	Roads Option	RN	SPM	SPNM		P	SPNM	SPM	RN	RN	SPM	SPNM	RN	SPM	SPNM	
0	3	3	0	0	3		X		X	0	0	0	3	0	0	3
2.B.2	3	3,503	346	0	3,849		X	X	X	0	0	0	3,503	346	0	3,849
3.B	2	4,638	0	0	4,638				X	0	0	0	4,638	0	0	4,638
4.B.1	1	819	185	0	1,004	X	X			-819	-185	1,004	0	0	1,004	1,004
4.D	1	25	0	0	25		X	X	X	0	0	0	25	0	0	25
4.E.1	2	124	42	0	166		X	X	X	0	0	0	124	42	0	166
4.G.1	3	4,901	57	0	4,958				X	57	-57	0	4,958	0	0	4,958
4.H	3	5,708	1,243	0	6,951		X	X	X	0	0	0	5,708	1,243	0	6,951
4.I	1	483	359	0	842	NO DATA AVAILABLE				0	0	0	483	359	0	842
5.A	4	101	0	0	101				X	0	0	0	101	0	0	101
7.D	2	1,505	28	0	1,533		X	X	X	0	0	0	1,505	28	0	1,533
7.E.2	3	5	0	0	5	NO DATA AVAILABLE				0	0	0	5	0	0	5
8.D	3	28,976	1,192	0	30,168				X	1,192	-1,192	0	30,168	0	0	30,168
8.D.1	3	15,698	182	0	15,880				X	182	-182	0	15,880	0	0	15,880
9.G	2	24,870	1,426	0	26,296				X	1,426	-1,426	0	26,296	0	0	26,296
9.H	2	18,456	345	0	18,801		X		X	345	-345	0	18,801	0	0	18,801
				TOTAL	115,220								112198	2019	1004	115,221

Table B-53. Acres by Management Prescription by ROS Setting Oconeee National Forest-Alternative D

		GIS ROS Setting			Total-GIS	SARRWAG ROS Setting				Assigned Acreage Changes			New Totals			Reassigned Total
Alt D Mgt Rx	Roads Option	RN	SPM	SPNM		P	SPNM	SPM	RN	RN	SPM	SPNM	RN	SPM	SPNM	
0	3	3	0	0	3		X		X	0	0	0	3	0	0	3
2.B.2	3	9,211	1,589	0	10,800		X	X	X	0	0	0	9,211	1,589	0	10,800
3.B	2	4,638	0	0	4,638				X	0	0	0	4,638	0	0	4,638
4.B.1	1	819	185	0	1,004	X	X			-819	-185	1,004	0	0	1,004	1,004
4.D	1	25	0	0	25		X	X	X	0	0	0	25	0	0	25
4.E.1	2	54	42	0	96		X	X	X	0	0	0	54	42	0	96
4.G.1	3	5,155	57	0	5,212				X	57	-57	0	5,212	0	0	
5.A	4	101	0	0	101				X	0	0	0	101	0	0	101
7.D	2	1,426	14	0	1,440		X	X	X	0	0	0	1,426	14	0	1,440
7.E.2	3	5	0	0	5	NO DATA AVAILABLE				0	0	0	5	0	0	5
8.D	3	29,454	1,302	0	30,756				X	1,302	-1,302	0	30,756	0	0	30,756
8.D.1	3	15,746	182	0	15,928				X	182	-182	0	15,928	0	0	
9.G	2	24,976	1,689	0	26,665				X	1,689	-1,689	0	26,665	0	0	26,665
10.A	3	18,202	345	0	18,547				X	345	-345	0	18,547	0	0	18,547
				TOTAL	115,221								112572	1645	1004	115,221

Table B-54. Acres by Management Prescription by ROS Setting Oconeee National Forest-Alternative E

		GIS ROS Setting			Total-GIS	SARRWAG ROS Setting				Assigned Acreage Changes			New Totals			Reassigned Total
Alt E Mgt Rx	Roads Option	RN	SPM	SPNM		P	SPNM	SPM	RN	RN	SPM	SPNM		SPM	SPNM	
0	3	3	0	0	3		X		X	0	0	0	3	0	0	3
2.B.2	3	3,503	346	0	3,849		X	X	X	0	0	0	3,503	346	0	3,849
3.B	2	4,638	0	0	4,638				X	0	0	0	4,638	0	0	4,638
4.B.1	1	819	185	0	1,004	X	X			-819	-185	1,004	0	0	1,004	1,004
4.D	1	25	0	0	25		X	X	X	0	0	0	25	0	0	25
4.E.1	2	143	42	0	185		X	X	X	0	0	0	143	42	0	185
4.G.1	3	4,901	57	0	4,958				X	57	-57	0	4,958	0	0	4,958
4.H	3	5,708	1,243	0	6,951		X	X	X	0	0	0	5,708	1,243	0	6,951
4.I	1	483	359	0	842	NO DATA AVAILABLE				0	0	0	483	359	0	842
5.A	4	101	0	0	101				X	0	0	0	101	0	0	101
6.A	1	2,228	380	0	2,608		X		X	380	-380	0	2,608	0	0	2,608
7.D	2	685	28	0	714		X	X	X	0	0	0	685	28	0	714
7.E.1	2	8,156	23	0	8,179		X	X	X	0	0	0	8,156	23	0	8,179
7.E.2	3	5	0	0	5	NO DATA AVAILABLE				0	0	0	5	0	0	5
8.A.1	3	2,626	0	0	2,626				X	0	0	0	2,626	0	0	2,626
8.B.1	3	10,862	163	0	11,024				X	163	-163	0	11,024	0	0	11,024
8.D	3	28,976	1,192	0	30,169				X	1,192	-1,192	0	30,169	0	0	30,169
8.D.1	3	15,698	182	0	15,880				X	182	-182	0	15,880	0	0	15,880
9.G	2	20,191	1,205	0	21,396				X	1,205	-1,205	0	21,396	0	0	21,396
9.H	2	64	0	0	64		X		X	0	0	0	64	0	0	64
				TOTAL	115,221								112176	2042	1004	115,221

Table B-55. Acres by Management Prescription by ROS Setting Oconeee National Forest-Alternative F

		GIS ROS Setting			Total-GIS	Sarrwag Ros Setting				Assigned Acreage Changes						Reassigned Total
Alt F Mgt Rx	Roads Option	RN	SPM	SPNM		P		SPM	RN	RN	SPM	SPNM	RN	SPM	SPNM	
3.B	2	4,638	0	0	4,638				X	0	0	0	4,638	0	0	4,638
4.B.1	1	819	187	0	1,006	X	X			-819	-187	1,006	0	0	1,006	1,006
4.D	1	229	3	0	232		X	X	X	0	0	0	229	3	0	232
4.E.1	2	28	42	0	70		X	X	X	0	0	0	28	42	0	70
4.G.1	3	5,314	57	0	5,371				X	57	-57	0	5,371	0	0	5,371
7.B	2	936	0	0	936				X	0	0	0	936	0	0	936
7.D	2	201	0	0	201		X	X	X	0	0	0	201	0	0	201
8.D.1	3	13,895	496	0	14,391				X	496	-496	0	14,391	0	0	14,391
10.A	3	79,169	3,278	0	82,447				X	3,278	-3,278	0	82,447	0	0	82,447
99	n/a	4,586	1,343	0	5,929	NO DATA AVAILABLE				0	0	0	4,586	1,343	0	5,929
				TOTAL	115,221								112827	1388	1006	115,221

Table B-56. Acres by Management Prescription by ROS Setting Oconeee National Forest-Alternative G

Alt G Mgt Rx	Roads Option	GIS ROS Setting RN	GIS ROS Setting SPM	GIS ROS Setting SPNM	Total-GIS	SARRWAG ROS Setting P	SARRWAG ROS Setting SPNM	SARRWAG ROS Setting SPM	SARRWAG ROS Setting RN	Assigned Acreage Changes RN	Assigned Acreage Changes SPM	Assigned Acreage Changes SPNM	New Totals RN	New Totals SPM	New Totals SPNM	Reassigned Total
0	3	3	0	0	3		X		X	0	0	0	3	0	0	3
2.B.2	3	6,382	955	0	7,337		X	X	X	0	0	0	6,382	955	0	7337
3.B	2	4,638	0	0	4,638				X	0	0	0	4,638	0	0	4638
4.B.1	1	819	185	0	1,004	X	X			-819	-185	1,004	0	0	1,004	1004
4.D	1	249	96	0	344		X	X	X	0	0	0	249	96	0	344
4.E.1	2	143	42	0	185		X	X	X	0	0	0	143	42	0	185
4.G.1	3	5,155	57	0	5,212				X	57	-57	0	5,212	0	0	5212
4.H	3	2,829	634	0	3,463		X	X	X	0	0	0	2,829	634	0	3463
4.I	1	2,390	0	0	2,390	NO DATA AVAILABLE				0	0	0	2,390	0	0	2390
5.A	4	101	0	0	101				X	0	0	0	101	0	0	101
6.A	1	5,583	457	0	6,040		X		X	457	-457	0	6,040	0	0	6040
7.D	2	2,741	28	0	2,769		X	X	X	0	0	0	2,741	28	0	2769
7.E.1	2	5,487	56	0	5,543		X	X	X	0	0	0	5,487	56	0	5543
7.E.2	3	5	0	0	5	NO DATA AVAILABLE				0	0	0	5	0	0	5
8.A.2	2	8,102	53	0	8,155				X	53	-53	0	8,155	0	0	8155
8.D	3	28,976	1,192	0	30,169				X	1,192	-1,192	0	30,169	0	0	30169
8.D.1	3	15,746	182	0	15,928				X	182	-182	0	15,928	0	0	15928
9.G	2	20,402	1,468	0	21,870				X	1,468	-1,468	0	21,870	0	0	21870
9.H	2	64	0	0	64		X		X	0	0	0	64	0	0	64
				TOTAL	115221								112406	1811	1004	115221

Table B-57. Acres by Management Prescription by ROS Setting Oconeee National Forest-Alternative I_M

		GIS ROS Setting				SARRWAG ROS Setting				Assigned Acreage Changes			New Totals			Reassigned Total
Mgt Rx	Roads Option	RN	SPM	SPNM		P	SPNM	SPM	RN	RN	SPM	SPNM	RN	SPM	SPNM	
0	3	143	0	0	143		X		X	0	0	0	143	0	0	143
2.B.2	3	2,897	685	0	3,582		X	X	X	0	0	0	2,897	685	0	3,582
3.B	2	9,305	57	0	9,363				X	57	-57	0	9,363	0	0	9,363
4.B.1	1	819	185	0	1,004	X	X			-819	-185	1,004	0	0	1,004	1,004
4.D	1	816	398	0	1,214		X	X	X	0	0	0	816	398	0	1,214
4.E.1	2	69	42	0	112		X	X	X	0	0	0	69	42	0	112
4.H	3	3,770	960	0	4,731		X	X	X	0	0	0	3,770	960	0	4,731
5.A	4	102	0	0	102				X	0	0	0	102	0	0	102
6.B	3	1,588	28	0	1,616				X	28	-28	0	1,616	0	0	1,616
7.E.1	2	947	38	0	984		X	X	X	0	0	0	947	38	0	984
7.E.2	3	8,322	62	0	8,384	NO DATA AVAILABLE				0	0	0	8,322	62	0	8,384
8.D	3	30,111	1,337	0	31,449				X	1,337	-1,337	0	31,449	0	0	31,449
8.D.1	3	16,177	193	0	16,369				X	193	-193	0	16,369	0	0	16,369
9.F	1	563	31	0	594	NO DATA AVAILABLE				0	0	0	563	31	0	594
9.H	2	34,186	1,390	0	35,576		X		X	1,390	-1,390	0	35,576	0	0	35,576
				TOTAL	115,221								112001	2216	1004	115,221

NATIONAL SURVEY ON RECREATION AND THE ENVIRONMENT METHODOLOGY

DATA AND APPROACH

The National Survey on Recreation and the Environment (NSRE) is the United States' on-going, federal survey, the earliest one dating back to the Outdoor Recreation Resources Review Commission of 1960 (Cordell et al., 1996).

In the 1960 National Recreation Survey, 23 outdoor activities ranging from playing outdoor sports and games to mountain climbing were included (Outdoor Recreation Resources Review Commission 1962). In each successive National Survey, activities have been added as the scope of outdoor activities in which Americans participate has broadened. The survey, NSRE in 2000-01, includes 77 specific activities that range from walking for pleasure to snowboarding to rock climbing. The recreation itinerary of Americans has expanded enormously since the 1960s and the participation module in the NSRE has been broadened accordingly. A full listing of the activities included can be reviewed at www.srs.fs.fed.us/trends. For each of the 77 activities, survey respondents were asked whether they had participated to any extent during the previous 12 months. Thus, the data we draw upon for this paper are binomial measures for each activity indicating whether the respondent had participated (yes=1) or not (no=0). Later applications of the NSRE generate data also on days of participation and number of trips away from home for outdoor recreation.

DEMOGRAPHIC PROFILE MODULE

The NSRE demographics module follows the Census 2000 design for generating population profiles across a variety of social strata (Office of Management & Budget, 1997). For federal surveys, alignment with Census designed population descriptors is required, not optional. To meet this requirement, and more importantly, to permit comparisons of percentage distributions of NSRE respondents across a range of demographic descriptors with percentage distributions representative of the U. S. population, close alignment with Census was necessary. This alignment allowed us to weight the NSRE data to compensate for over or under representation of age, race, sex, education and urban-rural residency. Questions were posed to individuals through telephone interviews. In the Chattahoochee survey, 1,349 telephone interviews were conducted from a population cross section of 9,509,621. On the other hand 1,611 telephone interviews from a population of 11,848,990 were generated in the Oconee/Sumter survey. Data from this survey is outlined in the *Recreation* section of the FEIS. Questions asked of respondents included age, household structure, income, race, ethnicity, country of birth, income, tenure at current address, and other characteristics. The content and design of the demographics module of the NSRE can be reviewed at www.srs.fs.fed.us/trends.

OPERATING PROCEDURES FOR THE NSRE

Guided by specifications of sample size and geographic distribution from the overall NSRE sampling plan, phone numbers for phone interviewing were obtained from Survey Sampling, Inc (SSI), a Connecticut-based phone sampling firm. SSI was chosen because the company subjects all numbers to extensive cleaning and validation to ensure that listed exchanges are currently valid, and can provide customers with a random digit dial (RDD) sample using a phone number database of working blocks. A block is a set of 100 contiguous numbers identified by the first two digits of the last four numbers (e.g., in number 559-4200, 42 is the block).

These working blocks are entered into a computer-aided telephone interviewing system (CATI). Once the CATI system has randomly selected and dialed a telephone number the interviewer, upon hearing someone answer, identifies the survey, its main purpose, and the name of the research laboratory (Presser, Blair, & Triplett, 1992). The interviewer then inquires how many people in the household are 16 years or older, and asks to speak to the person 16 or older who had the most recent birthday (Link & Oldendick, 1998; Oldendick, Bishop, Sorenson, & Tuchfarber, 1988). Upon reaching an appropriate person and receiving agreement to be interviewed, the interviewer then reads the survey questions as they appear on the computer screen. Using a computer to control the progression of the survey, skip patterns are executed as programmed, data entry occurs as the survey is being administered, responses are screened to assure they are within range, and missing data problems are corrected. If no person is contacted or an answering machine is obtained, the interviewer enters a code (e.g., busy, no answer). If the timing of the call is inconvenient, a call back is scheduled for another date and time (Presser, Blair, & Triplett, 1992)

Sampling

Sampling across the country's population and locations was designed to provide a minimum number of interviews for each state so that individual state reports on participation across all activities could be generated and so that reliable estimates of activity participation could be computed for activities with less than a 10-percent national participation rate. To achieve these objectives, a sampling strategy for achieving a national sample of 50,000 completed interviews was developed that combined proportional nationwide population sampling aiming for 29,400 completed interviews and a quota sample distributing 400 interviews to each state and totaling 20,600 completed interviews. Sampling occurred throughout the year(s) during which the NSRE was being conducted to minimize seasonal recall bias to the extent possible.

There are sources of bias that are addressed through data weighting and other approaches as necessary. For one, equally distributing a quota of 400 across the 50 states over samples rural areas (e.g., 64.6% Urban, 27.4% Near Urban, and 8.0% Rural). In addition, random digit dialing reaches a random sample of telephone numbers, rather than of people. Affluent families are virtually certain to have a telephone number (97%), often more than one. At the other end of the scale, many

low-income households do not have a telephone (ranging from 8 to 23% depending on geographic area). As a result, affluent people are likely to be somewhat over represented in the survey sample (Bowen, 1994; Groves, 1990; Tucker, Lepkowski, Casady, & Groves, 1992).

Another source of bias comes from language barriers through the undesirable but unavoidable exclusion of people who cannot speak either English or Spanish. According to the 2000 Census, 12.5 % of the U.S. population is Hispanic. For the non-English speaking segment of the Hispanic population, the NSRE was being conducted in Spanish. The most difficult part of this process is getting the translation generic enough for overall comprehension by all the various Hispanic dialects. Other non-English speaking U.S. residents were excluded from the survey. The complexity of the translation and interviewing processes made interviewing in all languages prohibitively costly.

WATERSHED CUMULATIVE EFFECTS MODEL

Six National Forests in the Southern Appalachians (SA) have drafted revised Land and Resource Management Plans. In May 2002, the regional office and SA Steering Team approved a process to meet the planning requirements (36 CFR.219.23) for effects analysis on aquatic resources. The following is a summary description of the process used to address Section (d) of the aquatic resources under 36 CFR.219.23 planning rule (1982) and the associated cumulative effects for water quality and associated beneficial uses.

Background

The effects analysis process was developed to estimate sediment yields and analyze the cumulative effects of proposed management actions on water quality. The process provides an objective process to systematically evaluate water quality conditions for watersheds covered in whole or part by forest plans. The process also supports aquatic viability analysis on a watershed basis. Sediment is an appropriate measure to determine the effects of management activities on water quality and its associated beneficial uses on forested lands (Coats and Miller, 1981). Sediment increases can adversely affect fish productivity and diversity (Alexander and Hansen, 1986), degrade drinking water and affect recreational values. There may be other cumulative impacts such as increases in water yield as a result of harvesting methods. However, water yield models do not characterize the impacts of all management activities such as road construction and the increase in water yield is generally less than the natural variability. Changes in water nutrients or nutrient fluxes within streams as a result of management activities are minor and not an appropriate consideration of cumulative effects at the forest plan level. This model uses predicted sediment yields as the surrogate for determining cumulative impacts for water quality.

The cumulative effects model was developed by Alan Clingenpeel, Forest Hydrologist on the Ouachita National Forest, for use in the SA planning process. Clingenpeel provided assistance to the SA Forests by developing required data, determining coefficients and running the sediment model. After the structure was developed using data common to all Forests, each individual Forest customized the model using local data.

The following steps outline the process used. Please see Clingenpeel (2003) for a detailed description of the model.

1) Determine current watershed condition
    a. A Geographic Information System (GIS) and spatial data sets were used to characterize 5th Level Hydrologic Unit Codes (HUCs) for the Forest. Forty-three 5th Level HUCs with NF land were analyzed for the Chattahoochee-Oconee National Forest. A complete list of these can be found in the Plan and EIS.

b. Spatial data sets provided by each Forest included: 5th Level HUC boundaries, ATV trails, and a GIS layer of management prescriptions mapped for each alternative.
c. Existing spatial data sets used included: Tiger data roads layer, BASINS data set for point sources, dams, Digital Elevation Models (DEMs), Ecoregion boundaries, and land use data (National Land Use Classification Data).

2) The Forest provided the following information:
   a. The number of acres of prescribed fire planned by alternative, period, and physiographic zone (or ecoregion). In order to make the prescribed fire estimate sensitive to alternatives, the FWRBE early-successional option was assumed to be the best surrogate measure of anticipated prescribed fire activity. That is, alternatives that permitted the greatest amount of early-successional habitat creation were the least constrained and could be expected to have the larger prescribed fire program. FWRBE early-successional options are described in the FWRBE Team recommendation outline (10-08-2002 version).

      The maximum annual prescribed fire program for the Chattahoochee-Oconee combined is assumed to be 30,000 acres distributed as: 20,000 acres in Piedmont ecological Section; 3,000 acres in Ridge & Valley Section; and 7,000 acres in Blue Ridge Section.

      The estimated prescribed fire program acres used in the cumulative effects model for all ecological Sections are listed below in Table B-58 and Table B-59

Table B-58. Blue Ridge and Ridge & Valley Ecological Sections

Alt.	Weighted Average FWRBE Option Value	Rank	Blue Ridge Estimated Prescribed Fire Program Acres	Estimated Prescribed Fire Program Acres
G	1.52	1	1820	780
E	1.78	2	2730	1170
I	2.09	3	3815	1635
A	2.16	4	4060	1740
B	2.34	5	4690	2010
D	2.58	6	5530	2370

Table B-59. Appalachian Piedmont Ecological Section.

Alt.	Weighted Average FWRBE Option Value	Rank	Fire Program Acres
G	2.45	1	14,500
I	2.70	2	17,000
E	2.74	3	17,400
B	2.76	4	17,600
D	2.85	5	18,500
A	2.90	6	19,000

b. Estimated miles of dozer fireline per acre burned and constructed fireline per 1000 acres burned. Data from past prescribed fire projects and professional judgment were used to estimate miles of bladed or plowed firelines per 1000 acres by ecological Section.

c. Estimated miles of temporary road constructed per acre regenerated. Timber sales planned or timber sales planned and implemented between 1985 and 1998 were examined to determine an average number of temporary road miles per acre harvested. Estimates were provided by ecological Section, listed in Table B-60.

Table B-60. Estimated Average Miles of Temporary Road Construction Per Acre Treated by Ecological Section.

Ecological Section	Total Number of Timber Sales Reviewed (planned or implemented sales) OR sample size	Total Treated Acres	Total Miles of Temporary Road Construction (planned or implemented)	Average Miles per Acre
Blue Ridge	211	29,627	320.7	.0108
Ridge & Valley	22	7,897	67.3	.0085
Piedmont	118	35,315	201.6	.0057

d. Estimated percent increase in urban growth for the area that includes the Chattahoochee-Oconee National Forest. This estimate was based on professional judgment of local trends and varied by ecological Section. The urban growth rate for the Piedmont and Ridge & Valley Sections was estimated to be 1 percent over a ten-year period. The urban growth rate for the Blue Ridge Section was estimated to be 2 percent over a ten-year period. The Blue Ridge Section is currently experiencing an increase in first- and second-home development, tourism, and general urban growth. These estimates were not used for socio-economic analysis, or based on any data. They were used to address private land in order to complete a watershed-based modeling process.

e. The estimated rotation period on other forested lands. This estimate was based on professional judgment of local trends and knowledge about private industry forestry operations. The estimated rotation period for private forestry lands in the Blue Ridge and Ridge & Valley Sections was 100 years. The estimated rotation period for private forestry lands in the Piedmont Section was 40 years.

f. The slope break used to create spatial data sets and model erosion. A slope break of 25% was selected for the Chattahoochee-Oconee based on previous slope analysis for Spectrum modeling. The 25% break is only one piece of slope analysis considered for spectrum modeling. It is an

estimate of the maximum slope for harvesting using overland skidding without skid trail.

3) Coefficients were selected. Coefficients for erosion were taken from the average and high erosion rates found in Dissmeyer and Stump (1978) for the appropriate physiographic zone. Recovery rates were determined from studies on the Ouachita National Forest. These recovery rates were determined through field observations and provide a realistic recovery value for the Southeast. They are also appropriate for this scale of analysis. It should be recognized that the high erosion rates used from published literature would yield overestimations of erosion for most Forest Service activities and should be viewed as a worst-case scenario. The high rates were used to account for steep slopes and management practices on other lands that may not have the same operational standards (Best Management Practices) as Forest Service lands.

4) Erosion and sediment delivery were calculated:

   a. Erosion values were multiplied by a sediment delivery coefficient based on watershed size determined from Roehl (1962).
   b. Sediment values from roads, ATV trails and firelines were determined by ecoregion using methodology developed through the Watershed Erosion Prediction Project or WEPP (Elliot et al., 1999). Coefficients were expressed in tons per mile of road, ATV trail, or fireline.

5) A spreadsheet model combined all calculations for each fifth level watershed, resulting in a summary that includes baseline and current sediment yield. Forest spectrum outputs for each alternative were entered into the spreadsheet model. Spectrum outputs were grouped by combinations of ecoregion, residual basal area (as a surrogate for method-of-cut), slope, and period.

6) Baseline sediment yield for each watershed was calculated with the assumption the watershed had an undisturbed forest floor with no roads. Current sediment yield for each watershed was calculated using existing land use/cover data and existing road data.

7) Watershed Condition Ranks (WCRs) were established to compare alternatives, and also incorporated into other products or analyses. In order to establish WCRs, the current sediment average annual yield was determined and expressed as a percent above baseline conditions. This provided a relative measure to determine changes within watersheds. Next, a species-sediment load relationship was developed. This score was modified by a weighted average where the watershed occurs in more than one physiographic zone. Watershed condition was generalized into three categories of excellent, average, or below average. This score was referred to as the Watershed Condition Rank or WCR.

8) Comparison of Alternatives. In addition to using watershed condition ranks (WCRs) to compare alternatives, the percent increase in sediment yield due to modeled Forest Service activities was calculated. This was calculated by 1) adding the estimated sediment yield due to FS activities for each watershed. This includes adding the "Land Sediment FS" and "Road Sediment" categories from the summary worksheet; 2) This sum was then divided by the total current sediment yield (from summary worksheet) and multiplied by 100 in order to determine the percent increase only from these modeled FS activities. These percentages should only be used as a mathematical index to compare alternatives. The calculated percent increase due to FS activities does not include estimated reductions in sediment yield when mitigation measures are used. Best Management Practices (BMPs) and Plan Standards will reduce and minimize sediment yield when these activities are implemented.

Assumptions

The model created for this effort is an analytical tool used to consistently compare alternatives. As with any model, assumptions were made through its design and implementation. Major assumptions include:

- Sediment yield is an appropriate surrogate for determining cumulative impacts to water quality;
- Fifth level Hydrologic Unit Codes (HUCs) or watersheds are the appropriate scale of analysis for cumulative effects to water resources;

Appropriate erosion coefficients from Dissmeyer and Stump (1978) approximate erosion rates from land use activities on Chattahoochee-Oconee NF lands

FOREST SCALE ROADS ANALYSIS PROCESS (RAP)

Roads analysis (RA) is an integrated ecological, social, and economic approach to transportation planning, addressing both existing and future roads- including those planned in unroaded areas. Roads analysis neither makes decisions nor allocates lands for specific purposes. It is intended to provide an analysis of the existing transportation system from environmental and socioeconomic perspectives and highlight concerns and opportunities for corrective action that serve as a basis for making knowledgeable decisions regarding management of road and forest resources (FSM 7712.1). Roads analysis helps implement forest plans by identifying management opportunities that can lead to site-specific projects.

The RA process can be applied to a diversity of land area scales. At the broadest forest-level scale, the analysis provides a context for formulating policies and management decisions.

The FS roads analysis process is fully described in Roads Analysis: Informing Decisions About Managing the National Forest Transportation System, FS-643 (USDA Forest Service 1999). The process includes the following:

- Step 1 – Setting up the analysis.
- Step 2 – Describing the situation.
- Step 3 – Identifying issues.
- Step 4 – Assessing benefits, problems, and risks.
- Step 5 – Describing opportunities and setting priorities.
- Step 6 – Reporting.

Several possible scales of analysis are appropriate to support road management decisions. The scale of analysis depends on the issues to be addressed and potential changes to existing management direction. The scales range from a national scale down to a project or site-specific scale. A broad-scale analysis is essential to establish context, provide guidance, define analysis units at finer scales, allocate budgets and expertise, establish schedules, and address issues that cross national forest boundaries. A forest-wide RA is a typical broad-scale analysis. This scale is also appropriate for informing the Forest Plan decision. For the Chattahoochee-Oconee NF, this scale of analysis also gives the benefit of analyzing the interconnectivity of FS roads with county roads or roads of other jurisdiction that cross the NF or are in close proximity. Other scales of RA commonly used or referred to include watershed-scale or project-scale.

The steps identified above were incorporated into a forest-wide product informing the forest plan decision process. The Chattahoochee-Oconee RA was completed through a contract with Science Application International Corporation (SAIC), specifically with the SAIC group located in Shalimar, Florida. SAIC worked closely with the Forest Service, including the Engineering staff area and Forest Plan revision interdisciplinary team, throughout the entire process. The contract with SAIC began in July 2002 and

ended May 2003, although work on the forest-wide roads analysis was started before July by Forest personnel. The complete Chattahoochee-Oconee National Forest RA report (USDA Forest Service, 2003) is on file at the Forest Supervisor's office in Gainesville, GA. Please refer to this report for more details about any of the steps described below.

The steps used by the Forest and described more fully in the final RAP report include:

1) Introduction
    a. Description of FS Roads Analysis Policy

2) Description of the existing National Forest transportation system and natural and human environment features and processes on the Chattahoochee-Oconee NF.
    a. Generate baseline data – The Forest was divided into 5 analysis units, based on ecological subsection boundaries. This was consistent with our ecological approach to planning.

    b. Tie to Chattahoochee-Oconee Forest Plan – the revised forest plan includes a roading option for each management prescription. The RA identifies management opportunities such as road closure or conversion that could be further refined using the road option for each prescription.

3) Identify the Issues
    a. Plan revision issues – A decision was made at the regional level to use the plan revision list of issues for forest-scale roads analysis. The Southern Appalachian Assessment (SAA) process furthered identified issues for the plan revision and the forest-scale roads analysis. This forest-scale analysis informs the forest plan decision, and numerous public meetings were held to generate the list of plan revision issues. Roads analysis at the forest scale had to be completed in conjunction with the forest plan decision. Experience indicated that further public meetings would have put in jeopardy the timely completion of the document and it's availability to inform the forest plan decision. Due to the plethora of public meetings for plan revision and the entire SAA process, there was little expectation that further public meetings would have generated new issues.

    b. Identify any additional issues from other road-management authorities or local governments. FS and county roads, together, provide a transportation network to meet Forest and local needs. The Georgia Department of Transportation (DOT) and counties are cooperators with jurisdictional and maintenance responsibilities for roads that traverse the Forest. A letter was sent to all county commissioners and the Georgia DOT to help identify any issues related to the connectivity of FS

and county roads. The responses of the counties and Georgia DOT were incorporated into the RA as applicable.

4) Develop process for assessing road benefits, problems, and risks
   a. Define Geographic Information System (GIS) Analysis Criteria, thresholds, and metrics. A review of existing methods identified the Synoptic Method approach (U.S. Environmental Protection Agency, 1992) and the Equivalent Roaded Acres index approach (U.S. Forest Service, 1988) as methods that contained the procedural attributes, level of intensity, and GIS emphasis that could meet the objectives of the Chattahoochee-Oconee roads analysis. The Synoptic Method (SM) is a rapid, inexpensive, systematic process developed by the U.S. Environmental Protection Agency to evaluate the effects of resource loss and/or restoration on landscape function. The Equivalent Roaded Acres (ERA) index approach was developed by the FS to estimate the potential for cumulative watershed effects.

      The INFRA program is a FS computerized application used to store and manage NF infrastructure, including roads, trails, and facilities. Select INFRA Oracle database tables were used to obtain relevant information corresponding to roads inventory, bridges, major culverts, and recreational areas. INFRA and GIS spatial data sets were used together to complete analysis and overlay functions for maps and information in the final RA report. Both INFRA and GIS data sets are highly dynamic sources of data. These databases are frequently updated. The RA went ahead with a "snapshot" of each of these from summer 2002.

      Analyses conducted in this step were based on the issues, and then grouped accordingly. Each of these indices includes both rules of combination necessary to complete the GIS portion of analysis and a set of assumptions. The complete list of rules of combination and assumptions can be found in the final roads analysis report for the Forest. The analysis categories are as follows:

      i. Define Road Disturbance Index – the road disturbance index includes the extent of road disturbance associated with road maintenance activities and road density.
      ii. Define Road Access Index – the road access synoptic screening process includes four indicators: road network connectivity, FS access obligations, forest health, and forest productivity.
      iii. Define Water Quality Index – water quality synoptic index indicators include soil erodibility (soil K-Factor, slope, extent of unpaved roads), hydrologic connectivity, and sedimentation.
      iv. Define Aquatic Habitat Index – Federally listed PET and FS Sensitive fish species are included.

5) Summarize road management opportunities and priorities

The forest-scale RA informed the plan revision process at a strategic level through a series of interdisciplinary meetings where the Forest Plan revision team reviewed RA documents and considered Plan language and direction. The concepts of "access" and reducing road-related sediment are examples of topics or analyses that were captured through goals, objectives and standards in the Plan. The GIS data warehouse generated by the RA was used to complete the draft Plan and EIS, as well as between draft and final versions for further analysis, based on public comments. The contractors were able to complete complex GIS analysis that would have been difficult or impossible to complete on-site due to equipment or personnel limitations. These data and resulting information were used to complete additional analyses as needed for incorporation of the RA into the final Plan and EIS documents.

The final RA did not provide a road-by-road opportunity. Groups of roads were prioritized based on the data available and resulting analysis. Road-specific recommendations are appropriate for watershed- or project-level RA.

The RA also identified several opportunities that would be implemented at the project level, including road removal, road closure, and road conversion. The analysis units utilized in the RA were prioritized for these options based on the GIS analysis completed in previous steps.

a. Road management opportunities
    i. Road removal, closure or conversion

       The RA identified several opportunities that would be implemented at the project level, including road removal, closure, or conversion. The analysis units utilized in the RA were prioritized for these options based on the GIS analysis completed in previous steps.

    ii. Sub-Forest scale sediment delivery mitigation assessments

       This is incorporated in the plan through objectives for watershed assessment. Priority for watersheds assessments are given for watersheds with sediment-related impaired stream reaches or where federally-listed aquatic species occur.

b. Road management priorities – In this step, a process for screening and ranking FS road value and risk attributes was established. The concept used in this step is designed to translate readily into screening and analysis of individual roads and road segments at the watershed and project RA scales.

HERITAGE RESOURCES SITE PROBABILITY ANALYSIS

Site probability acres within high ground disturbance management prescriptions presented in chapter 3 of the EIS were generated using GIS base data. Specific site probability areas within the Ridge and Valley, and Blue Ridge physiographic regions were determined by querying acreage within slope indices contained in the 10 meter Digital Elevation Model GIS layer. The parameters described in the Heritage Resources section of the EIS to delineate site probability were based upon the current site predictive model for the Chattahoochee-Oconee National Forests (Wynn et al. 1994).

The Piedmont region (Oconee Ranger District) site probability acres presented in Table 3-178 were based upon distance to a permanent water source. The GIS layer depicting USGS 1:24,000 blue line streams was used to identify permanent water sources. Slope indices parameters contained in the Forest site predictive model are then used at the project level for final determination of site probability acres.

SPECIES VIABILITY EVALUATION PROCESS

National Forest Management Act (NFMA) regulations, adopted in 1982, require that habitat be managed to support viable populations of native and desirable non-native vertebrates within the planning area *(36 CFR 219.19*). USDA regulation 9500-004, adopted in 1983, reinforces the NFMA viability regulation by requiring that habitats on national forests be managed to support viable populations of native and desired non-native plants, fish, and wildlife. These regulations focus on the role of habitat management in providing for species viability. Supporting viable populations involves providing habitat in amounts and distributions that can support interacting populations at levels that result in continued existence of the species well distributed over time.

Risk to maintenance of viability over the next 50 years was assessed for each species in relation to each of its principle habitat relationships by plan revision alternative. Risk assessment was based on three factors:

1) Current species abundance
2) Expected habitat abundance in 50 years
3) Expected habitat distribution in 50 years (Figure below)

Once risk ratings were developed, we assessed how well management strategies across alternatives provide for species viability.

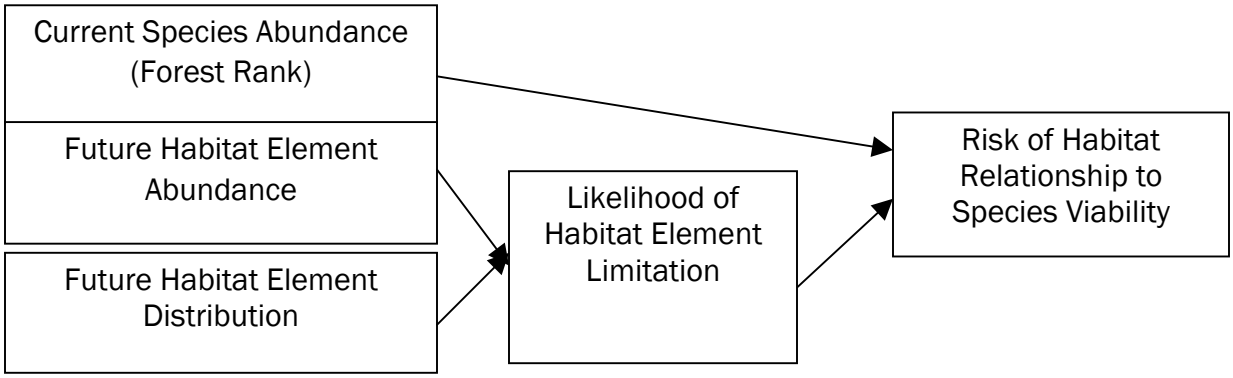

Figure B-8. Relationship of Variables used to rate the risk to viability resulting from a species' relationship with a habitat element.

A comprehensive list of species with potential viability concern was compiled for the Chattahoochee-Oconee National Forests. The list includes those species found, or potentially found, on the National Forest from the following categories:

- Species listed as proposed, threatened, or endangered under the Federal Endangered Species Act,
- Species listed on the Regional Forester's Sensitive Species list,

- Species identified as locally rare on the National Forest by Forest Service biologists,
- Birds of conservation concern as identified by the US Fish and Wildlife Service, and
- Declining species of high public interest.

Species lists from all national forests in the Southern Appalachian and Piedmont Eco-regions, and Coastal Plain forests in Alabama, were pooled to create comprehensive lists of species of potential viability concern. NatureServe staff and contractors assigned abundance ranks for each species on the comprehensive eco-region list for Chattahoochee-Oconee National Forest. These Forest Ranks, or F Ranks, follow the conventions used by NatureServe and others in defining State and Global Ranks.

F Ranks were used in viability risk assessment as a categorical variable representing a species' current abundance. Forest Service biologists reviewed F Ranks developed by NatureServe to identify any inconsistencies between these rankings and Forest Service information. Discrepancies in this abundance variable were resolved through coordination with NatureServe and its contractors. Where conflicting information or opinion on species abundance occurs, the most conservative information (i.e., that indicating lowest abundance) was used.

Only those species that are both confirmed present and rare or of unknown abundance (F1 through F3, and F?) on the Chattahoochee-Oconee National Forest were assessed for viability risk. Species ranked as F? were treated as F1 species to provide a conservative approach to those species for which abundance information is not available. Species that are currently abundant on the forest (F4, F5) are assumed to be at low risk of losing viability within the next 50 years, and, therefore, were not further evaluated for viability risk.

WILDLIFE HABITAT ANALYSIS

The FWRBE Team enlisted the help of the Forest Service Inventory and Monitoring Institute (IMI), a detached Washington Office unit located in Fort Collins, CO, to develop a GIS based analysis of wildlife habitat dynamics. The IMI personnel used Arc Markup Language (AML) to crosswalk existing CISC forest cover types into broad vegetation communities (i.e., wildlife habitats) with which animal species groups had already been associated by the FWRBE Team. The AML 'tracked' the changes over time for each alternative for each of these habitats. In usage, this analysis came to be called the 'IMI analysis' as a namesake for those who wrote the AML.

The Arc Macro Language (AML) analysis process provided data to help make recommendations for how to address effects analysis for FWRBE-related elements in Southern Appalachian forest plan and EIS documents. Broad community types were analyzed using species and age class distribution of vegetation on the Chattahoochee-Oconee National Forest. This data was then analyzed using Forest Plan management prescriptions and seven different alternatives developed for implementing the Chattahoochee-Oconee forest plan. The broad scale communities analyzed for the forest include the following:

- Mix of Early– and Late-Successional Forests
- Mid- and Late-Successional Mesic Hardwood Forests
- Oak Forests
- White Pine Plantations and Upland Encroachment
- Oak, Mixed, and Pine Woodlands, Savannas, and Grasslands
- Yellow Pine Forests
- High-Elevation, Early-Successional Habitat

The AML process involved forest input Plan Revision CISC and GIS data. The forest also gave input on chosen management prescriptions, land allocations based on the themes of seven alternatives for implementing the forest plan. After individual forest data was collected the data was entered into a model which includes the following steps:

- Install Effects Analysis Macros and INFO look-up tables.
- Data Preparation.
- Run the STANDS AML to prepare GIS data for effects analysis
- Run the ALTS AML to perform the GIS effects analysis
- Use ORACLE to perform summary calculations:
- Use ORACLE to create summary output file

After the data was produced from the AML analysis, individual forests analyzed the data and applied it to the effects analysis for the plan EIS.

In writing effects analysis we made use of broader scale assessments that were available, including:

- Southern Appalachian Assessment
- Southern Forest Resource Assessment
- Early Successional Habitat and Open Lands Assessment

Key points and products to be provided in effects analysis by topic were:

- Science-based context for the topic by briefly summarizing scientific literature.
- Description of existing conditions on each forest.
- Disclosure of effects and habitat outcomes by alternative.
- Conclusion as to whether the distribution and abundance of relevant habitat is likely to be capable of supporting viable populations of associated species. (See the preceding discussion of the Viability Evaluation Process in this appendix)

SUMMARY OF THE SUPPLY AND DEMAND PORTION OF THE ANALYSIS OF THE MANAGEMENT SITUATION

TIMBER SUPPLY AND DEMAND ANALYSIS

As part of the Analysis of the Management Situation, a timber supply and demand analysis was done for each of the Chattahoochee and the Oconee. The analysis considered an analysis area; called the 'timber market area' of 11.5 million acres for the Chattahoochee and a 16.5 million acre timber market area for the Oconee. This area was defined by the locations of mills that had historically purchased NF timber. The analysis considered all ownerships. Each analysis area included National Forest in adjacent states. Analysis data was from custom reports from the Forest Inventory and Analysis unit of the Southern Forest Experiment Station.

Within the Chattahoochee timber market area, National Forest timber inventory is particularly important in white pine sawtimber (56-percent) and in hardwood sawtimber (19 to 50 percent). Within all species groups, National Forest assumes a much greater market importance as a holder of high-quality sawtimber than its small timberland area would suggest. The Chattahoochee NF tracks well with this overall pattern. The Chattahoochee has almost 40-percent of white pine sawtimber inventory and 27 percent of Grade 1 white pine sawtimber. With 7 percent of timberland, the Chattahoochee has a hardwood Grade 1 inventory by species ranging from 14 to about 16 percent. That is, it is a significance potential supplier of the highest quality hardwood sawtimber. Conversely, the Forest Service is able to exert a dominant influence on the ability of wood industry that uses either high-quality white pine or high-quality red oak as their raw material to expand their operations. The Forest Service is able to exert a significant influence on hardwood supply across all grades.

The Southern Appalachian Assessment found that the Brasstown, Toccoa, Tallulah, and Cohutta Ranger Districts of the Chattahoochee combined produced about 32 percent of all timber produced within their aggregate land area when averaged across the years 1983, 1986, 1989, and 1992. Immediately to the north of the Brasstown Ranger District, the Tusquitee Ranger District of the Nantahala NF had a 53 percent production share. To the north of the Cohutta Ranger District, the Hiwassee – Tellico – Ocoee Ranger Districts on the Cherokee NF in Tennessee, as a group, had about a 24 percent share of production. The Chattooga Ranger District of the Chattahoochee NF had about 16 percent production share. On the Andrew Pickens Ranger District of the Sumter NF in South Carolina; just east of the Chattooga RD, the production share averaged about 7 percent. The Armuchee Ranger District of the Chattahoochee NF had the lowest share at about 4 percent. (SAMAB.1996. Rpt 4:124)

In summary, the Chattahoochee has historically been an important, but not a dominant, supplier of timber within the Georgia portion of its market area. It has been particularly important in the mountain interior counties; even more so when the

effect of national forest in Tennessee and North Carolina is also factored in. Its importance to supply declines outside the mountains by roughly 50 percent. When contrasted with its timber inventory (supply) position, it is easy to see that Forest Service timber production has been neither proportionate to its timberland area nor reflective of its timber supply strengths. Stated another way, Forest Service timber management has always been very conservative compared to either the potential of the land or the potential of the markets.

For the Oconee timber market area, neither the Forest Service generally, nor the Oconee specifically are major holders of timber inventory. The primary reason for this is that the Oconee is such a small fraction of the timberland base. Favorable terrain and good roads allow much longer haul distances from mills. Wood concentration yards further facilitate large procurement areas. As with the Chattahoochee, the Oconee has the potential to be a small, but important, supplier of high-quality timber, especially hardwoods and pine 'peeler logs' for veneer production. Currently, National Forest as a holder of high-quality oak is nearly twice as important as just its timberland area would suggest. However, harvest of the limited amount of hardwood on National Forest as a program emphasis would be nearly certain to result in strong public opposition from a variety of sources.

The Oconee NF historic market share for its entire analysis area is approximately 1 percent of softwood timber products and 0.1 percent of hardwood timber products. When the analysis is refined to just those counties 50 percent or more within the analysis area, the Oconee production share rises to about 5 percent in softwood and 0.7 percent in hardwood.

Demand, as measured by price, has been on a rising trend for yellow pine sawtimber and for the northern red oak and white oak sawtimber. White pine and yellow poplar do not show strong trends of increase but do maintain their value consistently. In high demand markets, prices of formerly cheaper species and product combinations rise temporarily but fall back as demand slackens. Moderate and low value species and product combinations fluctuate fairly widely with economic conditions but do not show a trend of either increasing or decreasing value. Pine roundwood had begun to show a softening in demand by a fall in price just as the analysis was done. Subsequently, its price has continued to fall. Hardwood roundwood, however, has gained in price and is now more expensive that pine. This situation is expected to continue for some time.

Projecting long term demand trends is complex. Many factors are at work to both increase and decrease demand such that a net effect is not clear. It is reasonable to expect that if purchasers do not see unacceptable risks, national forest timber will be competitive on the market and the market will exist.

WILDLIFE SUPPLY AND DEMAND ANALYSIS METHOD

The analysis area for supply and demand for the wildlife resources is the Chattahoochee-Oconee National Forests, Georgia, or the Southeastern United States, dependent on the source of data collected. Users of wildlife resources on the Chattahoochee-Oconee National Forests come from many areas within and adjacent to the forests. The Forests occur in the northern half of the state, with the Chattahoochee occurring at the extreme north end of the state. The forests are close to several fast-growing counties. Atlanta, Athens, Macon, Chattanooga, and Gainesville are also in close proximity to the forests. With population centers adjacent to the forests, the demand is great for consumptive and non-consumptive uses of wildlife resources.

To determine the market area regarding the demand for wildlife uses on the Chattahoochee-Oconee National Forests is difficult. Large game hunters may give a better indication on where the wildlife users are coming from, because it provides some level of knowledge to managers through the use of hunting licenses and Wildlife Management Areas (WMA) stamps.

The method use to determine the hunter use and success on the Chattahoochee-Oconee National Forests is as follows: Georgia Department of Natural Resources (GADNR) mailed questionnaires on hunter effort and harvest to 10,189 licensed, resident hunters (3.1%) on March 1986. Two follow-up mailings were conducted among non-respondents at 2-week intervals. In total 4,505 hunters responded to the questionnaire, and 676 indicated they hunted on national forest land. A sample (N = 203) of these hunters, who indicated that they used the national forest, was interviewed by telephone. Telephone interviews confirmed whether hunters had used the Chattahoochee or Oconee National Forests, determined whether use was inside or outside of a WMA, and provided effort and harvest success data for various game species hunted on open forestland. Effort and harvest success data for WMAs was obtained through check-in and checkout procedures (Holbrook, 1986).

Southeastern Cooperative Wildlife and Fisheries Statistic Project (SCWFSP) at North Carolina State University in Raleigh computed the estimates and variances from the mail survey. In general, estimates were obtained by fitting a quadratic equation to the results of each of the three mailings; variances were computed by mean square successive differences (Holbrook, 1986). For the telephone survey, estimates and variances of the number of people hunting different game species were computed for binomial experiments (Ott, 1977). Estimates for man days effort and harvest levels were obtained by computing means. Variances for man days effort and harvest levels were obtained by dividing the sum of the squared deviations by $\underline{N}$-1 (Ott, 1977).

In summary, The designation of the Chattahoochee-Oconee as an Urban National Forest states that the NFs are less than one hour from more than one million people. Because of the proximity to Atlanta and the surrounding metropolitan areas the

forests anticipate very significant increases in uses of the forest resources (further discussed in supply and demand for recreation). As mentioned previously, the activities related to wildlife use are primarily—but not limited to—hunting, trapping, fishing, and viewing. The "products" being evaluated include large game species (white-tailed deer and black bear), game birds (wild turkey, grouse, woodcock, quail, dove, ducks, and geese), and small game (squirrel, raccoon, and rabbit). Game fish include primarily trout, bream, crappie, and catfish. Wildlife viewing may include all wildlife, although songbirds are often the featured attraction.

SUPPLY AND DEMAND FOR WILDERNESS

Nationally, there has been support for designating more wild areas of federal lands for Wilderness according to the Wilderness Act direction. National Forests near urban areas such as Atlanta represent one of the most important opportunities to meet increasing demand for outdoor recreation closer to people's homes. In Georgia on the Chattahoochee N.F., support for protection of wilderness and wilderness-like areas has increased over the years, particularly since urban sprawl from Atlanta continues to grow into unpopulated areas. In the past, the Forest has responded to demand by having 117,378 acres designated by Congress as Wilderness; one congressionally designated National Recreation Area, and one congressionally designated Scenic Area.

In a response to current demand (that was based upon forest wilderness use (trailhead use), telephone surveys, and comment letters that specifically requested more land be set aside for wilderness or for primitive experiences), the Forest Plan revision allocates for wilderness study, an additional 8,100 acres recommended for wilderness designation. In addition, there are approximately 56,000 wilderness-like (primitive) acres allocated to maintain the areas roadless (or primitive) characteristics.

WATER SUPPLY AND DEMAND ANALYSIS

A water supply and demand analysis was completed for the *Analysis of the Management Situation* report for the Chattahoochee-Oconee National Forests in 1996. The National Forest system lands administered by the Forest Service in Georgia occur within six of the fourteen river basins of the State. The Chattahoochee occurs mostly in the high elevation, headwaters position of four basins, while the Oconee is in the central portion of the two river basins where it occurs. Two basins draining the Chattahoochee, the Coosa and the Chattahoochee, are experiencing increasing demands, mainly due to population growth. The State of Georgia has been through a decade of intensive planning and negotiations on water supply and demand, particularly in the Atlanta Metropolitan area. Interstate negotiations have been ongoing since the mid-1990s with the adjoining states of Alabama and Florida over the allocations of water from river basins shared by the states.

The source area for supply is the land within the proclamation boundary of the Forests. Supply analysis for water in the 1996 AMS estimated an average water yield (supply) from the Forests of 2,296,000 acre-feet of water per year, or roughly 2.7 feet of water for each acre of National Forest land. This supply is derived almost exclusively from surface water sources in North Georgia such as springs, streams and rivers. Ground water aquifers are limited in the northern portion of the State due to the underlying geology, mainly granite and gneiss. The primary role of the National Forests in managing supply is to protect and conserve the lands in public ownership producing the water runoff needed for consumptive uses.

Both on-Forest uses and downstream off-Forest withdrawals were reviewed for the demand side of the analysis. The market area was established as those withdrawals within the proclamation boundary and 25 miles downstream from the boundary. Demand on the Forest is low. Two public water supply systems and some 175 individual domestic uses under permit constitute the main public demands. Forest Service water use, for domestic and instream, was estimated at about 81,000 gallons per day. Uses are mainly for recreation, administrative, fire control and maintaining instream flows essential for aquatic habitats. The supply is more than adequate for Forest Service uses. Off-Forest demand, mainly downstream, is within current supply levels. Sixteen public water supply systems occur within the planning area serving small cities and towns. The combined withdrawal for these systems (under permit by the State) is about 29 million gallons per day. Industrial uses make up over two-thirds of water use downstream including hydroelectric and thermoelectric power generation, carpet manufacturing, textiles and food processing. Agricultural uses, e.g. irrigation, are low within the planning area.

The conclusion of the supply and demand analysis for water was supply or yield should remain at current levels under the projected conditions of management in the future. Demand within the Forest boundary will likely remain at current levels;

however, it is anticipated that downstream demands will increase, particularly in the larger towns experiencing population growth.

Source references for the analysis were USDI-U.S. Geological Survey water reports, Southern Appalachian Assessment Report 2 – Aquatic, Georgia Environmental Protection Division water reports and USDA Forest Service 1995 RPA Report.

RECREATION SUPPLY AND DEMAND ANALYSIS

A recreation market analysis for the Chattahoochee-Oconee National Forests was completed as part of the Analysis of the Management Situation report for the Chattahoochee-Oconee National Forests in 1996. The market area size for any recreational facility is based on the distance/ time traveled, as well as the presence of any similar intervening recreational activities. One source for distance traveled would be the 1995 Georgia Statewide Comprehensive Outdoor Recreation Plan (SCORP). This five year-year plan guides local, state, and federal agencies and the private sector in recreation and natural resources planning and development. In 1994, the Division of Parks, Recreation, and Historic Sites conducted a survey of its users visiting its' state parks. Of a total of 5,460 visitor surveys—results indicated that most visitors arrived at its' recreation sites by vehicle and were making vacation trips. On the average, visitors travel about 73 miles to reach a state park. In the same venue, with respect to the Chattahoochee-Oconee National Forests, pat research has demonstrated that most national forest visits originate from within a 75-mile (1.5 to 2 hour driving time) radius. (*Public Use and Preferred Objectives for Southern Appalachian National Forests –Chattahoochee-Oconee and Sumter National Forests, 2002*). The market area has been defined as all counties that fall within a 75-mile straight-line radius from a forest administrative border.

The market area for the Chattahoochee-Oconee National Forests includes the market areas defined for the Sumter National Forest in South Carolina. These market areas were combined in recognition of shared local markets and similar geography and demographic patterns. The Chattahoochee National Forest has the largest market area sample size within Region 8 with 2,361 while the Oconee had 1,366. (*Public Survey Report-Public Use and Preferred Objectives for Southern Appalachian National Forests-Chattahoochee-Oconee and Sumter National Forests* , Forest Service, 2002). The Oconee National Forest has the largest percentage of upper income category respondents due primarily to their proximity to the affluent suburbs of Atlanta. The largest cities within this shared market area include Atlanta, Chattanooga, Columbia, and Greenville/Spartanburg.

Region 8–wide travel data from March 1996, indicates that the primary activity for forest visitation (Region 8 wide) was some form of camping. Approximately 33 percent of all such trips are not more than 50 miles long within Region 8. In other words, people living within 50 miles of the place they visited take 33 percent of trips with camping as the primary purpose. People within 75 miles of the place they visited take 51 percent of the trips for camping; 100 miles, 67percent; 125 miles, 67 percent; 150 miles,78 percent. For day use activities: at 50 miles,87 percent; 75 miles, 90 percent. Non–motorized trail use indicates at 50 miles, 38 percent; 75 miles, 44 percent; 100 miles, 62 percent; 150 miles, 63 percent; 175 miles, 67 percent; 175 miles,70 percent; 200 miles, 74 percent; and 225 miles, 75 percent. (letter- March, 4,1996, file code 2300, subject: Visitor Behavior for trips to Region 8 Forests, signed by David G. Holland, outdoor Recreation and Wilderness Assessment

Research Unit—Don English, Research Social Scientist, U.S. Department of Agriculture, Southeastern Experiment Station, Athens, Georgia.).

The National Survey on Recreation and the Environment (NSRE) is the on-going federal survey. The survey , NRSC in 2000-2001, includes 77 specific activities that ranged from viewing/photographing nature to day hiking. These recreation participation figures on the Chattahoochee-Oconee National Forests are outlined in Chapter 3 of the plan EIS. Participation rates within each recreational activity were within a 3 to 5 percent range.

On the Chattahoochee-Oconee National Forests, travel distances are shorter, federally managed recreational resources closer to population centers, (i.e. Atlanta) will sustain a relatively greater share of increased demand. A greater amount of user pressure will be placed on these federal recreation sites near the high population areas near the Chattahoochee-Oconee National Forests.

The rate of demand growth will be greatest for some strenuous activities, including swimming, day hiking, backpacking, and mountain biking. Many activities take place in undeveloped environments and or on or near trails. Other activities with generally high rates of projected demand growth include driving for pleasure, visit historic sites, visiting wilderness areas, and developed camping.

A high degree of user pressure will be placed on trail and scenic resources near population centers. These are resources that provide a primary resource base for activities such as day hiking, backpacking, horseback riding, sightseeing, and driving for pleasure. Natural resources near population centers are the recreational resources that will undergo the most land conversion and use pressures as the population of Georgia continues to grow.

SOCIAL AND ECONOMIC ANALYSES

ECONOMIC AND LOCAL GOVERNMENT IMPACT ANALYSES

The purpose of this portion of Appendix B is to provide interested readers with additional details regarding the social and economic analyses. This section does not provide sufficient information to replicate the analysis. For that level of detail, the companion specialist reports contained in the process record should be consulted.

THE MODELS

Economic effects to local counties were estimated using an economic input-output model developed with IMPLAN Professional 2.0. IMPLAN (Impact Analysis for Planning) is a software package for personal computers that uses the latest national input-output tables from the Bureau of Economic Analysis. The software was originally developed by the Forest Service and is now maintained by the Minnesota IMPLAN Group, Inc. (MIG). Data used for the impact analysis was from secondary data for those counties considered to be in the forests' impact areas. The assumption used in this modeling process was that the impact area comprised the counties within which there is some National Forest ownership. County data is used in the model to develop economic impact response coefficients for the analysis area (defined by the county data selected).

Input-output analysis gives estimates of employment and income for an increase in final demand on certain sectors of the economy. For Forest Service timber, for example, we have looked at the saw mill and pulpwood industries where our timber goes as the first processing step in manufacturing. Impacts include all those industries initially impacted as well as those industries linked with supplying inputs to production, as well as workers in those industries who spend wages in their households (known as direct, indirect and induced effects, respectively). Thus, the impact assumes a new demand is made on the economy and estimates what this new increase in final demand will mean in employment and income to that economy. Input-out put modeling (an efficiency analysis which tells how income and jobs are distributed throughout an economy for a given economic impact) has nothing to do with benefit-cost (an efficiency analysis which estimates how efficient monies are spent on investment activities.

DEPENDENCY ANALYSIS

The IMPLAN model was used to assess the economic dependencies of the Southern Appalachian national forests' planning area. Economic dependency is a way of assessing the strength of regional or local economies. Regional economies generally depend on their exports to sustain most local income and employment. Based on this data, it is reasonable to estimate economic dependency by examining an area's export base. The export base analysis done for this EIS measured the total

contribution of one sector, or industry to the economy. Industries can import and export similar commodities. Those industries having more exports than imports are considered "basic," and thereby allow "new" money to enter the economy. Basic industries allow an economy to grow.

DIVERSITY ANALYSIS

Using IMPLAN employment and income reports, forest planners illustrated the relative importance of major sectors and industries, such as wood products and tourism. Employment, industrial output, and total income to workers and proprietors were contrasted to the total for the entire forest economy to gauge the percentage relationship between the two. Using IMPLAN models from two years (1985 and 1996) a change in economic characteristics is illustrated.

Shannon-Weaver Entropy Indices

The Shannon-Weaver Entropy Indices were also used to show relative diversity of the counties. Economic diversity indices, using the Shannon-Weaver entropy function (Shannon and Weaver, 1949), have been computed for all U.S. counties, labor market areas, BEA functional economic areas, BEA component economic areas, and states using IMPLAN employment data for the years 1977, 1982, 1985 and 1990-1993. Also, indices have been computed for three levels of industry aggregation: 1-, 2- and 4-digit SIC groups. These data are available in various spreadsheet and database formats.

If economic diversity is defined as "the presence in an area of a great number of different types of industries" or "the extent to which the economic activity of a region is distributed among a number of categories," then it is useful to have a summary statistic to describe the diversity of an area and compare it to other areas.

The entropy method measures diversity of a region against a uniform distribution of employment where the norm is equi-proportional employment in all industries. As it is applied to the regional estimate of employment data, the entropy measure of industrial diversity ***D*** is defined as:

$$D(E_1, E_2, \ldots E_n) = -\sum_n E_i \log_2 E_i$$

where:
n = the number of industries, and
E = the proportion of total employment of the region that is located in the ***i***th industry.

The indices contained in these databases have been normalized with respect to the maximum possible index for a given domain of industries (n) so that comparisons can be made between indices for 4-, 2- and 1-digit SIC aggregations. As a result, all indices range between 0 (no diversity) and 1.0 (perfect diversity). Specifically, the indices in these databases were computed as:

$$D(E_1, E_2, \ldots E_n) = (-\sum_n E_i \log_2 E_i) / MAX(D(E_1, E_2, \ldots E_n))$$

where:
n = 528 (4-digit SIC), 70 (2-digit SIC), or 12 (1-digit SIC).
Two important properties of the index are:
(1) The maximum value of D is attained when the E are all equal. This is the case where the region is totally diversified in the sense that all industries contribute equally to the region's employment. Also, the greater the number of industries sharing the region's economic activity, the greater the value of D.
(2) D = 0 when only one of the E = 1 and the remaining are 0. This is an extreme case where the economic activity of a region is concentrated in only one industry; therefore, economic diversity is totally absent.

FOREST CONTRIBUTION AND ECONOMIC IMPACT

An impact analysis describes what happens when a change in final sales (e.g. exports and residences) occurs for goods and services in the model region. Changes in final sales are the result of multiplying production data (e.g., head months of grazing or recreation visitor trips) times sales. Economic impacts were estimated for 2000, using the expenditure data for recreation, wildlife and hunting (U.S. Forest Service's National Visitor Use and Monitoring data [NVUM] and the Fish & Wildlife Service's wildlife use data, respectively); stumpage estimates for timber (see the 'Timber' portion of this Appendix), market prices for minerals (provided by the U.S. Minerals Management Service), and estimated animal allotment prices for Range (from the USDA Forest Service "Resource Pricing and Valuation Procedures for the Recommended 1990 RPA Program"). NVUM data were used by Daniel J. Stynes and Eric White, Michigan State University, July 2002 to estimate spending profiles of recreation users. The USDA Forest Service Inventory and Monitoring Institute, Ft. Collins, CO estimated spending profiles from the 1996 U.S. Fish & Wildlife Services wildlife data.

Impacts to local economies are measured in two ways: employment and total income. Employment is expressed in jobs. A job can be seasonal or year-round, full-time or part-time. The income measure used was total income expressed in year 2000 dollars. Total income includes both employee compensation (pay plus benefits) and proprietor's income (e.g. self-employed).

Data Sources

The planning area IMPLAN models were used to determine total consequences of dollar, employment, and income changes in selected sectors. Because input-output models are linear, multipliers or response coefficients need only be calculated once per model and then applied to the direct change in final demand. A Forest Service-developed spreadsheet known as "FEAST" (Forest Economic Analysis Spreadsheet Tool) was used to import the IMPLAN impact results (response coefficients) to each alternative, expressed in units of output. FEAST transforms the dollar impact for a given industry from IMPLAN to the resource output units obtained from SPECTRUM (e.g. ccf for timber or visits for recreation) by alternative. The multiplication of resource outputs and the IMPLAN response coefficients within FEAST yields a specific

employment and dollar output for each resource or activity. Specifications for developing IMPLAN response coefficients and levels of dollar activity are stated below.

Output levels for each resource can be viewed in various Forest FEAST spreadsheet files contained in the process records.

Timber

Sales Data – Sales data was determined by using timber values multiplied by estimated production levels for each alternative for salvage. Timber revenues for the 'green' (non-salvage) portion of the timber program came directly from the SPECTRUM model.

Use of the Model – Hardwood and softwood saw-timber were processed through the sawmill industry. Hardwood and softwood roundwood were assumed to be processed at the pulp mill. Impacts represent the economic activity occurring in all backward-linking sectors associated with the final demand output of the timber industries described above.

IMPLAN showed that, for every $1 million of total timber production in the forest impact area, a given level of dollar value of logs going into the mill result in this impact. Some of this output may be exported and generate new money for the local economy.

Range

Sales Data—The best available data for agriculture is found in the *1997 Census of Agriculture*. From this census, data for farm livestock inventory, tables 14, was used. Animal months of grazing on forest land were provided from the USDA Forest Service "Annual Grazing Report." This unit of use information was placed in FEAST to link with IMPLAN impact data in dollars to yield an impact for the range resource per unit of grazing (AUM).

Other Recreation and Wildlife and Fish

Expenditure Data—Recreation and Wildlife and Hunting trips were derived from the National Visitor Use and Monitoring survey, 2001 (NVUM) that is done for one-quarter of national forests each year. For those forests that have not been surveyed, data from a surveyed Appalachian forest served as proxy data, and adjustments were made by forest personnel based on pre-NVUM work for that forest. The resulting calculations yielded trips for resident and non-resident Day, On National Forest Overnight use, and Off National Forest Overnight Use. These use metrics were entered into FEAST to link with IMPLAN impact response coefficients to yield an impact for recreation and wildlife resources

While some analysts may not include resident participation in local economy impacts because there may be substitution opportunities for local residents to spend their discretionary dollar, we decided to include resident expenditures in the local

economy with the caveat that these expenditures were "associated" with the impacts not "responsible" for causing the impacts. The statement -is made that impacts are "associated" with recreation and wildlife resource impacts rather than "caused" by these impacts because local recreation users have many choices in an impact area for recreation. If some people choose not to recreate on national forest level land, they may recreate in another manner such as go to sporting events or a movie. The dollars would still be spent in the local economy causing a similar impact, but the provider of recreation would be a different party. Local residents are defined as recreation users within 50 miles of the forest boundary.

Federal Expenditures and Employment

Expenditure Data –A Forest budget was estimated for each alternative, and these estimates were used for forest expenditures, some of which had local economic effects. Total forest obligations for FY 2000 were obtained from the National Finance Center and used to identify total forest expenditures. The proportion of funds spent by program varied by alternative according to the theme for that alternative. Forest Service employment was estimated by the forest staff based on examination of historical Forest Service obligations. See Table 3-79 for budget information per alternative.

Use of the Model – To obtain an estimate of total impacts from Forest Service spending, salary and non-salary portions of the impact were handled separately. Non-salary expenditures were determined by using the budget object code information noted above. This profile was run through the model for non-salary expenditures per one million dollars, and the results multiplied by total forest non-salary expenditures. FEAST was again used to make the calculations. Local sales to the federal government are treated in the same manner as exports.

Salary impacts result from Forest Service employees spending a portion of their salaries locally. IMPLAN includes a profile of personal consumption expenditures for several income categories; the average compensation for an employee on the Southern Appalachian National Forests fell in the category of $30,000-$39,999.

Revenue Sharing – 25 Percent Fund Payments

Expenditure Data – Until September 30, 2001, Federal law required that 25% Fund Payments be used for only schools or roads or both. A split of 50 percent for schools and 50 percent for roads was used. One profile of expenditures was developed from within the county forest boundary model for 1) the highway construction sector and 2) local educational institutions. Because counties can choose to continue payments under this formula, traditional payments were analyzed (we assumed 50 percent of payments went to roads and 50 percent to education). Should counties choose fixed payments under the new law, the impacts would not vary by alternative. The impact of the fixed payment was not calculated.

Use of the Model – The national expenditure profile for state/local government education (schools) and local model estimates for road construction (roads) are provided within IMPLAN. One million dollars of each profile was used to obtain a response coefficient for these Forest Service payments to impact area counties. Sales to local government are treated in the same manner as exports.

Output Levels

Output levels for each item listed above can be viewed in various Forest FEAST spreadsheet files contained in the process records. These amounts are also located in the corresponding resource sections of the FEIS.

FINANCIAL AND ECONOMIC EFFICIENCY ANALYSIS

Financial efficiency is defined as how well the dollars invested in each alternative produce revenues to the agency. Economic efficiency is defined as how well the dollars invested in each alternative produce benefits to society. Present Net Value (PNV) is used as an indicator of financial and economic efficiency.

The Southern Appalachian forests used a Microsoft Office Excel electronic spreadsheet to calculate PNV for each alternative over a 50-year period. A 4 percent real discount rate, as prescribed by Forest service Handbook (FSH) 1909.17, was used. Decadal and 50 year cumulative present values for program benefits and costs as well as present net values are the product of this spreadsheet. For each decade, an average annual resource value was estimated, multiplied by 10 years, and discounted from the mid-point of each decade.

The financial values for range came from RPA estimates updated to 2000 dollars; for timber from average 1985-1996 stumpage prices provided by the Forest (See the 'Timber' portion of this Appendix); for minerals from market prices from the Minerals Management Agency; and prices for recreation and wildlife from RPA updated to 2000 dollars and transformed to NVUM unit measurements. All values are in 2000 constant dollars.

For the recreation and wildlife values, a conversion factor of 1.629 was used to convert from RVDs to "Visits." This factor was determined by taking the weighted average of hours for a site visit on the Jefferson and NF in NC (from which we had specific NVUM data). The weighted average turned out to be 19.5 hours per site visit. The hours per site visit of 19.5 was divided by 12 (number of hours in an RVD) to get the value of 1.629 visits = to 1 RVD. This factor was multiplied by the 1989 price of an RVD. For example, Hunting had a 1989 price of $33.27. It was increased by a factor of 1.629 to equal $54.18. This price was then inflated by the Gross National Price Deflator to 2000 (a factor of 1.2887) to yield $71.22.

Table B-61. Economic Benefits and Financial Revenue Values Used for Each Resource

Chattahoochee-Oconee National Forests	
Range ($/AUM):	
Cattle/Horses	$3.47
*Salvage Timber ($/MCF):	
Saw-Soft	$338
Saw-Hard	$269
Roundwood - Softwood	$29
Roundwood - Hardwood	$21
Minerals:	
Dimension Stone ($/Metric Ton)	NA
Crushed Stone ($/Metric Ton)	NA
Limestone ($/Metric Ton)	NA
Clay ($/Ton)	NA
Petroleum ($/Barrel)	NA
Natural Gas ($/cubic meter)	NA
Recreation ($/Visit):	
Camping, Picnicking, Swim.	$21.47
Mech. Travel, Viewing Scenery	$16.57
Winter Sports	$90.24
Resorts	$37.27
Wilderness (backpacking)	$45.67
Other Recreation	$132.67
Wildlife ($/Visit):	
Hunting	$71.22
Fishing	$141.43
Wildlife Watching	$84.88

** - Values for projected salvage volumes from unsuited lands. Values for projected volumes from suited lands came from the Spectrum model directly without calculation . NA: Not Applicable*

Timber values based on Forest harvest values; Recreation and Wildlife values based on non-market values in the USDA Forest Service "Resource Pricing and Valuation Procedures for the Recommended 1990 RPA Program;" Mineral value taken from historical prices from the U.S. Minerals Management Service.

Table B-62. Present Value of Costs and Benefits, and Present Net Value by Alternative (000 $s)

	Alt A	Alt. B	Alt. D	Alt. E	Alt. F	Alt. G	Alt. I_M
Cumulative Total Present Net Value	2,780,197	2,342,121	2,356,610	2,575,068	794,771	2,306,596	2,296,450
Present Value Benefits by Program:							
Range:	431	431	431	431	431	431	431
Timber:	239,375	280,070	324,677	104,792	300,639	75,448	196,239
Minerals:	0	0	0	0	0	0	0
Recreation	946,904	810,195	824,729	906,816	348,711	899,596	859,864
Wildlife:	1,977,071	1,688,344	1,688,344	1,810,760	673,826	1,567,692	1,574,890
PV of Benefits	3,163,782	2,779,041	2,838,181	2,822,800	1,323,608	2,543,167	2,631,424
Present Value Costs by Program:							
Range:	109	109	109	109	109	109	109
Timber:	197,019	250,400	295,085	61,096	342,364	49,925	151,950
Roads/Engineering	28,151	28,105	28,072	28,222	28,058	28,231	24,609
Minerals:	109	109	109	109	109	109	109
Recreation	46,477	46,477	46,477	46,477	46,477	46,477	46,477
Wildlife:	17,198	17,198	17,198	17,198	17,198	17,198	17,198
Soil, Water, Air.	16,153	16,153	16,153	16,153	16,153	16,153	16,153
Protection/Forest Health	44,758	44,758	44,758	44,758	44,758	44,758	44,758
Lands	10,776	10,776	10,776	10,776	10,776	10,776	10,776
Planning, Inventory and Monitoring	22,836	22,836	22,836	22,836	22,836	22,836	22,836
PV of Costs	383,585	436,920	481,572	247,732	528,837	236,571	334,974

STAKEHOLDERS AND DEMOGRAPHICS ANALYSIS

In recent years, the level of conflict over natural resource issues has increased substantially. As a result, much attention has been devoted to increasing our understanding of the dynamics of these conflicts, what they mean for stakeholders and natural resource managers, and what can be done to help managers and stakeholders better understand each other and work together to find ways to resolve conflicts before they occur.

We attempted to learn of the values, attitudes and beliefs of the neighbors to the Southern Appalachian forests through a random telephone survey. This survey was published under the title "Public Survey Report, Public Use and Preferred Objectives for Southern Appalachian National Forests," Cordell, K, et. al., June 2002. Copies are located at www.srs.fs.fed.us/trends.

Table B-63. County and State Population Characteristics – Population by Race. 1980

County/State	Persons	White	Black	Other Race	% Minority
State of Georgia	5,524,350	3,947,100	1,465,200	112,050	28.6%
Georgia Counties With Forest Service Ownership					
BANKS	8,735	8,254	433	48	5.5%
CATOOSA	37,222	36,528	289	405	1.9%
CHATTOOGA	22,020	19,914	1,887	219	9.6%
DAWSON	4,777	4,733	0	44	0.9%
FANNIN	14,840	14,691	7	142	1.0%
FLOYD	80,345	69,186	10,253	906	13.9%
GILMER	11,188	11,068	22	98	1.1%
GORDON	30,198	28,662	1,322	214	5.1%
GREENE	11,526	5,368	5,992	166	53.4%
HABERSHAM	25,109	23,540	1,321	248	6.2%
HALL	76,201	68,471	6,821	909	10.1%
JASPER	7,639	4,489	3,045	105	41.2%
JONES	16,679	11,499	5,013	167	31.1%
LUMPKIN	10,829	10,345	232	252	4.5%
MORGAN	11,675	6,800	4,751	124	41.8%
MURRAY	19,816	19,572	33	211	1.2%
OCONEE	12,517	11,130	1,268	119	11.1%
OGLETHORPE	9,041	6,073	2,830	138	32.8%
PUTNAM	10,295	5994	4272	29	41.8%
RABUN	10,512	10,352	66	94	1.5%
STEPHENS	21,932	19,045	2,637	250	13.2%
TOWNS	5,665	5,625	1	39	0.7%
UNION	9,429	9,363	3	63	0.70%
WALKER	56,719	53,989	2,328	402	4.8%
WHITE	10,168	9,687	392	89	4.7%
WHITFIELD	66,315	62,722	2,518	1,075	5.4%
Forest Area					
Total	601,392	537,100	57,736	6,556	10.7%
Average	23,130	20,658	2,221	252	10.7%

Source: U.S. Bureau of Census

Table B-64. County and State Population Characteristics – Population by Race. 1990

County/State	Persons		Black		% Minority
State of Georgia	6,478,240	4,603,400	1,744,900	129,940	28.9%
Georgia Counties With Forest Service Ownership					
BANKS	10,308	9,846	360	102	4.5%
CATOOSA	42,464	41,769	388	307	1.6%
CHATTOOGA	22,242	20,205	1,916	121	9.2%
DAWSON	9,429	9,287	27	115	1.5%
FANNIN	15,992	15,948	5	39	0.3%
FLOYD	81,251	69,501	11,021	729	14.5%
GILMER	13,368	13,246	35	87	0.9%
GORDON	35,072	33,497	1,324	251	4.5%
GREENE	11,793	5,869	5,884	40	50.2%
HABERSHAM	27,621	25,303	1,496	822	8.4%
HALL	95,428	83,445	8,097	3,886	12.6%
JASPER	8,453	5,436	2,942	75	35.7%
JONES	20,739	15,344	5,310	85	26.0%
LUMPKIN	14,573	13,971	206	396	4.1%
MORGAN	12,883	8,344	4,475	64	35.2%
MURRAY	26,147	25,957	67	123	0.7%
OCONEE	17,618	16,219	1,299	100	7.9%
OGLETHORPE	9,763	7,304	2,415	44	25.2%
PUTNAM	14,137	9235	4636	266	34.7%
RABUN	11,648	11,526	41	81	1.0%
STEPHENS	23,257	20,323	2,746	188	12.6%
TOWNS	6,754	6,723	0	31	0.5%
UNION	11,993	11,929	12	52	0.5%
WALKER	58,340	55,825	2,175	340	4.3%
WHITE	13,006	12,591	337	78	3.2%
WHITFIELD	72,462	67,710	2,944	1,808	6.6%
Forest Area					
Total	686,741	616,353	60,158	10,230	10.2%
Average	26,413	23,706	2,314	393	10.2%
Source: U.S. Bureau of Census					

Table B-65. County and State Population Characteristics – Population by Race. 2000

County/State	Persons	White	Black	Other Race	% Minority
State of Georgia	8,186,453	5,327,261	2,349,542	509,650	34.9%
Georgia Counties With Forest Service Ownership					
BANKS	14422	13435	464	523	6.8%
CATOOSA	53282	51356	669	1,257	3.6%
CHATTOOGA	25470	22084	2856	530	13.3%
DAWSON	15999	15554	57	388	2.8%
FANNIN	19798	19398	24	376	2.0%
FLOYD	90565	73668	12050	4,847	18.7%
GILMER	23456	21963	63	1,430	6.4%
GORDON	44104	39557	1527	3,020	10.3%
GREENE	14406	7628	6403	375	47.0%
HABERSHAM	35902	31910	1610	2,382	11.1%
HALL	139277	112470	10126	16,681	19.2%
JASPER	11426	8107	3115	204	29.0%
JONES	23639	17735	5506	398	25.0%
LUMPKIN	21016	19760	307	949	6.0%
MORGAN	15457	10772	4410	275	30.3%
MURRAY	36506	34789	226	1,491	4.7%
OCONEE	26225	23492	1683	1,050	10.4%
OGLETHORPE	12635	9892	2496	247	21.7%
PUTNAM	18812	12689	5625	498	32.5%
RABUN	15050	14280	119	651	5.1%
STEPHENS	25435	21808	3053	574	14.3%
TOWNS	9319	9207	12	100	1.2%
UNION	17289	16932	100	257	2.1%
WALKER	61053	57652	2310	1,091	5.6%
WHITE	19944	18979	432	533	4.8%
WHITFIELD	83525	67602	3214	12,709	19.1%
Forest Area					
Total	874,012	752,719	68,457	52,836	13.9%
Average	33,616	28,951	2,633	2,032	13.9%

Source: U.S. Bureau of Census

Table B-66. County and State Population Characteristics - Percent Change in Population. 1980 - 2000

	% Change 1980-1990		% Change 1990-2000	
County/State	**Population**	**Minority Population**	**Population**	**Minority Population**
State of Georgia	17.3%	18.9%	26.4%	52.5%
Georgia Counties With Forest Service Ownership				
BANKS	18.0%	-4.0%	39.9%	113.6%
CATOOSA	14.1%	0.1%	25.5%	177.1%
CHATTOOGA	1.0%	-3.3%	14.5%	66.2%
DAWSON	97.4%	222.7%	69.8%	213.4%
FANNIN	7.8%	-70.5%	23.8%	809.1%
FLOYD	1.1%	5.3%	11.5%	43.8%
GILMER	19.5%	1.7%	75.5%	112.4%
GORDON	16.1%	2.5%	25.8%	188.7%
GREENE	2.3%	-3.8%	22.2%	153.2%
HABERSHAM	10.0%	47.7%	30.0%	72.2%
HALL	25.2%	55.0%	45.9%	23.7%
JASPER	10.7%	-4.2%	35.2%	10.0%
JONES	24.3%	4.2%	14.0%	9.4%
LUMPKIN	34.6%	24.4%	44.2%	108.6%
MORGAN	10.3%	-6.9%	20.0%	3.2%
MURRAY	31.9%	-22.1%	39.6%	803.7%
OCONEE	40.8%	0.9%	48.9%	95.4%
OGLETHORPE	8.0%	-17.1%	29.4%	11.5%
PUTNAM	37.3%	14.0%	33.1%	24.9%
RABUN	10.8%	23.8%	29.2%	541.7%
STEPHENS	6.0%	1.6%	9.4%	23.6%
TOWNS	19.2%	-22.5%	38.0%	261.3%
UNION	27.2%	-3.0%	44.2%	457.8%
WALKER	2.9%	-7.9%	4.7%	35.2%
WHITE	27.9%	-13.7%	53.3%	132.5%
WHITFIELD	9.3%	32.3%	15.3%	235.1%
Forest Area				
Total	14.2%	9.5%	27.3%	72.3%
Average	14.2%	9.5%	27.3%	72.3%

Source: U.S. Bureau of Census

Table B-67. County and State Population Characteristics –Population Density and Density Change 1980, 1990, and 2000.

County State	Area (Square Miles)	2000 POP.	Population Density (Persons/Sq. Mile)			Population Density Change	
			1980	1990	2000	'80- '90	'90 - '00
State of Georgia	57819	8186453	94.5	112	141.6	18.5%	26.4%
Georgia Counties With Forest Service Ownership							
BANKS	234	14422	37.2	44.1	61.6	18.5%	39.8%
CATOOSA	162	53282	228.3	262.1	328.9	14.8%	25.5%
CHATTOOGA	314	25470	69.6	70.8	81.1	1.7%	14.6%
DAWSON	211	15999	22.6	44.7	75.8	97.8%	69.6%
FANNIN	386	19798	38.2	41.4	51.3	8.4%	23.9%
FLOYD	513	90565	155.6	158.4	176.5	1.8%	11.5%
GILMER	427	23456	26	31.3	54.9	20.4%	75.5%
GORDON	355	44104	84.7	98.8	124.2	16.6%	25.7%
GREENE	388	14406	29.4	30.4	37.1	3.4%	22.1%
HABERSHAM	278	35902	90	99.4	129.1	10.4%	29.9%
HALL	394	139277	192	242.2	353.5	26.1%	46.0%
JASPER	370	11426	20.4	22.8	30.9	11.8%	35.4%
JONES	394	23639	42.1	52.6	60	24.9%	14.1%
LUMPKIN	284	21016	37.9	51.3	74	35.4%	44.2%
MORGAN	350	15457	33.1	36.8	44.2	11.2%	20.0%
MURRAY	344	36506	57.2	76	106.1	32.9%	39.6%
OCONEE	186	26225	66.8	94.7	141	41.8%	48.9%
OGLETHORPE	441	12635	20.2	22.1	28.7	9.4%	29.6%
PUTNAM	361	18812	28.5	39.2	52.1	37.5%	32.9%
RABUN	371	15050	28.2	31.4	40.6	11.3%	29.2%
STEPHENS	179	25435	121.6	129.9	142.1	6.8%	9.4%
TOWNS	167	9319	33.8	40.4	55.8	19.5%	38.1%
UNION	323	17289	29.1	37.1	53.5	27.5%	44.3%
WALKER	446	61053	126.6	130.8	136.9	3.3%	4.7%
WHITE	242	19944	41.8	53.7	82.4	28.5%	53.5%
WHITFIELD	290	83525	226.8	249.9	288	10.2%	15.3%
Forest Area							
Total	8410	874012	71.5	81.7	103.9	14.3%	27.2%
Average	323	33615	71.5	81.7	103.9	14.3%	27.2%
Source: U.S. Bureau of Census							

Table B-68. County and State Population Characteristics – Urban and Rural Distribution and Percent Rural – 1980 and 1990.

County/State	1980			1990		
	URBAN	RURAL	% Rural	URBAN	RURAL	% Rural
State of Georgia	3,409,100	2,054,000	37.6%	4,097,339	2,380,877	36.8%
Georgia Counties With Forest Service Ownership						
BANKS	0	8,702	100.0%	0	10,308	100.0%
CATOOSA	18,262	18,729	50.6%	23,782	18,682	44.0%
CHATTOOGA	4,878	16,978	77.7%	5,025	17,217	77.4%
DAWSON	0	4,774	100.0%	0	9,429	100.0%
FANNIN	0	14,748	100.0%	0	15,992	100.0%
FLOYD	51,082	28,718	36.0%	51,589	29,662	36.5%
GILMER	0	11,110	100.0%	0	13,368	100.0%
GORDON	5,563	24,507	81.5%	7,135	27,937	79.7%
GREENE	2,985	8,406	73.8%	2,860	8,933	75.7%
HABERSHAM	3,203	21,817	87.2%	3,219	24,402	88.3%
HALL	18,058	57,591	76.1%	17,911	77,517	81.2%
JASPER	0	7,553	100.0%	0	8,453	100.0%
JONES	2,941	13,638	82.3%	3,754	16,985	81.9%
LUMPKIN	2,844	7,918	73.6%	3,086	11,487	78.8%
MORGAN	2,954	8,618	74.5%	3,483	9,400	73.0%
MURRAY	0	19,685	100.0%	2,865	23,282	89.0%
OCONEE	385	12,042	96.9%	796	16,822	95.5%
OGLETHORPE	0	8,929	100.0%	0	9,763	100.0%
PUTNAM	4833	5462	53.1%	4737	9400	66.5%
RABUN	0	10,466	100.0%	0	11,648	100.0%
STEPHENS	9,104	12,659	58.2%	8,266	14,991	64.5%
TOWNS	0	5,638	100.0%	0	6,754	100.0%
UNION	0	9,390	100.0%	0	11,993	100.0%
WALKER	30,721	25,749	45.6%	32,337	26,003	44.6%
WHITE	0	10,120	100.0%	0	13,006	100.0%
WHITFIELD	20,939	44,850	68.2%	21,761	50,701	70.0%
Forest Area						
Total	178,752	418,797	70.1%	192,606	494,135	72.0%
Average	6,875	16,752	70.9%	7,408	19,765	72.7%

Source: U.S.Bureau of Census

Table B-69. County and State Unemployment and Income in Counties with National Forest Land – 1980 and 1990.

County/State	1980			1990			Real Average Annual Income 1980-90	
	Unemploy-ment %	Per Capita Income	Median Income	Unemploy-ment %	Per Capita Income	Median Income	Per Capita % Change	Median % Change
State of Georgia	6.4	$6,380	$17,414	5.5	$13,631	$33,529	3.0%	1.9%
Georgia Counties With Forest Service Ownership								
BANKS	6.7	$5,497	$15,071	5.4	$10,741	$28,212	2.1%	1.6%
CATOOSA	6.8	$5,919	$17,886	4.6	$11,059	$29,657	1.6%	0.4%
CHATTOOGA	10.5	$5,054	$14,707	8.9	$9,281	$24,851	1.5%	0.6%
DAWSON	8.8	$5,084	$14,103	7.8	$12,198	$30,519	4.2%	3.1%
FANNIN	10.4	$4,670	$11,969	8.5	$9,430	$22,619	2.4%	1.7%
FLOYD	8.2	$6,218	$17,286	6.1	$12,121	$30,998	2.1%	1.2%
GILMER	9.1	$4,932	$13,267	7.3	$9,676	$24,888	2.1%	1.7%
GORDON	9.8	$5,571	$15,954	6.2	$11,587	$31,331	2.7%	2.1%
GREENE	5.9	$4,308	$12,679	6.6	$9,390	$23,963	3.2%	1.7%
HABERSHAM	7.9	$5,371	$14,817	5	$10,950	$28,824	2.5%	2.0%
HALL	6.7	$6,469	$17,817	5.3	$13,356	$34,147	2.6%	1.9%
JASPER	4.6	$5,277	$14,542	7	$10,761	$29,346	2.5%	2.4%
JONES	5.7	$5,833	$18,401	4.6	$13,543	$35,598	3.9%	2.0%
LUMPKIN	9.3	$5,384	$14,146	3.8	$10,814	$30,417	2.4%	3.1%
MORGAN	7.2	$4,886	$15,645	6.3	$10,713	$30,628	3.3%	2.1%
MURRAY	9.7	$5,580	$16,652	6.6	$10,575	$29,708	1.8%	1.2%
OCONEE	4.9	$6,708	$19,701	3.4	$15,164	$38,417	3.6%	2.1%
OGLETHORPE	7.2	$5,046	$15,067	5.3	$10,064	$28,175	2.3%	1.6%
RABUN	8.3	$5,469	$13,336	7.4	$11,161	$24,233	2.5%	1.3%
STEPHENS	9.8	$5,524	$15,139	6.6	$10,531	$27,768	1.8%	1.4%
TOWNS	5.3	$5,106	$11,004	5.5	$10,777	$23,114	2.9%	2.8%
UNION	7.5	$4,408	$10,327	4.9	$10,975	$24,334	4.6%	4.0%
WALKER	9.4	$5,671	$16,145	6.6	$10,575	$28,250	1.6%	1.0%
WHITE	7.9	$5,652	$14,933	5	$11,277	$27,830	2.3%	1.6%
WHITFIELD	8.7	$6,579	$18,015	5.3	$13,324	$32,423	2.4%	1.2%
Forest Area								
Average	7.9	$5,449	$15,144	6	$11,202	$28,810	2.6%	1.80%

Source: U.S. Bureau of Census

Table B-70. People of all Ages in Poverty – 1989 and 1995.

County/State	1989 Percentage		1995 Percentage	
	Estimate	90% Confidence Interval	Estimate	90% Confidence Interval
State of Georgia	14.7	14.6 to 14.7	15.6	15.1 to 16.0
Georgia Counties With Forest Service Ownership				
BANKS	15.1	13.3 to 17.0	14	11.2 to 16.8
LUMPKIN	12	11.0 to 13.0	11.7	9.4 to 13.9
CHATTOOGA	14.6	13.4 to 15.8	14.5	11.7 to 17.4
FANNIN	12.8	10.7 to 15.0	11.4	9.2 to 13.7
DAWSON	17.2	15.7 to 18.8	16.7	13.4 to 20.0
MURRAY	13.6	12.9 to 14.4	15.5	12.6 to 18.5
WHITFIELD	16.6	14.9 to 18.2	15.7	12.6 to 18.8
RABUN	11.1	10.3 to 12.0	12.6	10.1 to 15.0
CATOOSA	25.1	23.0 to 27.2	22.8	18.3 to 27.3
WHITE	11.6	10.5 to 12.6	11.5	9.3 to 13.8
UNION	10.6	10.1 to 11.1	12.7	10.2 to 15.2
OGLETHORPE	17.4	14.8 to 20.0	17	13.6 to 20.4
JONES	10.8	9.4 to 12.1	12.2	9.8 to 14.7
GORDON	15.3	13.3 to 17.2	14.1	11.2 to 16.9
JASPER	15	13.3 to 16.6	16	12.9 to 19.1
TOWNS	11.3	10.1 to 12.6	12.3	9.9 to 14.7
GILMER	7.9	6.8 to 8.9	7.6	6.0 to 9.2
MORGAN	16.2	14.2 to 18.1	17.3	12.6 to 22.0
GREENE	13.6	12.0 to 15.3	13.4	10.7 to 16.1
OCONEE	17	15.4 to 18.5	16.7	13.5 to 19.9
HABERSHAM	14	11.8 to 16.3	12.9	10.3 to 15.5
WALKER	18.3	16.5 to 20.1	14.8	11.8 to 17.9
STEPHENS	12.8	12.0 to 13.5	14	11.3 to 16.7
FLOYD	12.5	11.0 to 14.1	12.4	9.9 to 14.9
HALL	11.1	11.1 to 11.8	12.8	10.4 to 15.3
Forest Area				
Average.	14.1		14.1	

Source: U.S. Bureau of Census, Small Area Income and Poverty Estimates Program, February 1999

Table B-71. Household Data – 1980 and 1990

County/State	65+ Households % Change	Persons per Household		% Female Head of Household With Children Present	
		1980	1990	1980	1990
State of Georgia	25.0%	2.84	2.66	7.5%	7.8%
Georgia Counties With Forest Service Ownership					
BANKS	17.8%	2.86	2.73	2.5%	4.2%
CATOOSA	42.2%	2.92	2.67	5.4%	5.6%
CHATTOOGA	19.5%	2.81	2.61	5.0%	5.5%
DAWSON	57.7%	2.86	2.79	3.8%	5.0%
FANNIN	28.0%	2.65	2.5	3.4%	3.5%
FLOYD	21.6%	2.73	2.55	5.9%	6.3%
GILMER	26.2%	2.77	2.6	4.1%	3.8%
GORDON	23.9%	2.91	2.72	4.7%	5.3%
GREENE	0.8%	3.01	2.86	9.2%	11.1%
HABERSHAM	32.7%	2.79	2.59	4.5%	4.4%
HALL	36.0%	2.86	2.7	5.2%	5.4%
JASPER	11.6%	2.93	2.76	6.5%	9.7%
JONES	39.1%	3.11	2.81	6.3%	7.2%
LUMPKIN	36.3%	2.86	2.68	5.1%	4.3%
MORGAN	14.5%	3.13	2.89	6.4%	7.1%
MURRAY	35.0%	3.01	2.77	3.6%	3.9%
OCONEE	45.3%	2.93	2.84	4.6%	5.2%
OGLETHORPE	7.7%	3.03	2.7	4.4%	5.7%
RABUN	32.8%	2.66	2.48	4.2%	3.6%
STEPHENS	28.6%	2.72	2.54	5.3%	5.1%
TOWNS	58.0%	2.57	2.2	2.8%	2.5%
UNION	54.7%	2.76	2.5	3.1%	2.4%
WALKER	23.0%	2.86	2.65	4.3%	4.7%
WHITE	47.5%	2.77	2.55	4.4%	3.2%
WHITFIELD	25.9%	2.91	2.67	5.0%	5.3%
Forest Area					
Total	28.4%			5.0%	5.3%
Average	28.4%	2.86	2.65	5.0%	5.3%

Source: U.S. Bureau of Census

Table B-72. Household Data – 1980 and 1990 *(Source: U.S. Census Bureau)*

County/State	Total Housing Units			% Change			Median Value of Housing Units	
	1980	1990	2000	1970-80	1980-90	1990-00	1980	1990
State of Georgia	1,871,652	2,366,615	3,006,369	36.7%	26.4%	27.0%	$36,900	$71,300
Georgia Counties With Forest Service Ownership								
BANKS	3,034	3,775	5,364	42.6%	24.4%	42.1%	$23,600	$51,100
CATOOSA	12,648	15,745	20,425	48.9%	24.5%	29.7%	$34,500	$56,500
CHATTOOGA	7,733	8,467	9,577	19.8%	9.5%	13.1%	$19,800	$34,700
DAWSON	1,663	3,360	6,069	48.5%	102.0%	80.6%	$29,900	$80,900
FANNIN	5,522	6,334	8,369	29.8%	14.7%	32.1%	$22,000	$48,000
FLOYD	28,477	30,518	34,028	23.9%	7.2%	11.5%	$30,500	$50,100
GILMER	3,937	5,072	9,071	40.1%	28.8%	78.8%	$26,600	$56,800
GORDON	10,280	12,778	16,173	41.1%	24.3%	26.6%	$27,900	$53,100
GREENE	3,757	4,083	5,477	25.1%	8.7%	34.1%	$20,100	$38,800
HABERSHAM	8,396	9,966	13,259	36.9%	18.7%	33.0%	$29,000	$57,800
HALL	26,071	34,721	47,381	44.4%	33.2%	36.5%	$37,700	$75,400
JASPER	2,553	3,036	4,175	48.9%	18.9%	37.5%	$29,400	$51,100
JONES	5,270	7,300	8,659	57.6%	38.5%	18.6%	$34,000	$63,500
LUMPKIN	3,388	4,976	7,537	43.4%	46.9%	51.5%	$30,100	$63,500
MORGAN	3,663	4,399	5,558	30.9%	20.1%	26.3%	$29,500	$55,000
MURRAY	6,539	9,363	13,286	69.3%	43.2%	41.9%	$29,500	$52,000
OCONEE	4,237	6,156	9,051	70.2%	45.3%	47.0%	$44,500	$77,900
OGLETHORPE	2,947	3,581	4,849	35.6%	21.5%	35.4%	$26,400	$52,500
RABUN	3,891	4,630	6,279	44.9%	19.0%	35.6%	$33,200	$65,900
STEPHENS	7,787	8,949	9,951	20.6%	14.9%	11.2%	$27,900	$49,900
TOWNS	2,024	2,812	3,998	43.4%	38.9%	42.2%	$32,800	$69,400
UNION	3,369	4,709	7,159	55.0%	39.8%	52.0%	$27,000	$58,300
WALKER	19,634	21,697	23,605	25.6%	10.5%	8.8%	$27,600	$45,800
WHITE	3,499	4,907	7,731	49.2%	40.2%	57.6%	$33,800	$69,700
WHITFIELD	22,466	26,859	29,385	35.2%	19.6%	9.4%	$33,800	$61,200
Forest Area Total	202,785	248,193	316,416	36.3%	-95.1%	3087.2%		
Forest Area Average	8,111	9,928	12,657	36.3%	22.4%	27.5%	$29,644	$57,556

Table B-73. Personal Income and Transfer Payments – 1990 and 1997

	Per Capita Personal Income			Per Capita Government Transfer Payments		
County/State	1990	1997	1990-97	1990	1997	% Change-1990-97
State of Georgia	$17,385	$23,882	5.3%	$2,301	$3,498	7.4%
Georgia Counties With Forest Service Ownership						
Banks	$13,441	$18,745	5.6%	$1,734	$2,771	8.5%
Catoosa	$12,982	$17,259	4.7%	$1,837	$2,629	6.2%
Chattooga	$12,553	$17,750	5.9%	$2,544	$4,080	8.6%
Dawson	$15,002	$21,786	6.5%	$1,940	$2,803	6.4%
Fannin	$11,912	$16,571	5.6%	$3,017	$4,901	8.9%
Floyd	$15,862	$21,639	5.2%	$2,677	$4,218	8.2%
Gilmer	$14,617	$17,742	3.1%	$3,041	$4,477	6.7%
Gordon	$14,485	$19,802	5.2%	$2,032	$3,345	9.2%
Greene	$12,739	$17,809	5.7%	$2,605	$4,416	9.9%
Habersham	$14,810	$21,336	6.3%	$2,328	$3,916	9.7%
Hall	$16,546	$23,208	5.8%	$2,020	$3,241	8.6%
Jasper	$13,991	$19,584	5.7%	$2,454	$3,501	6.1%
Jones	$15,586	$20,046	4.1%	$1,879	$2,954	8.2%
Lumpkin	$13,593	$19,024	5.7%	$1,750	$2,849	9.0%
Morgan	$15,156	$21,748	6.2%	$2,449	$3,497	6.1%
Murray	$12,542	$16,342	4.3%	$1,544	$2,704	10.7%
Oconee	$17,923	$23,543	4.5%	$1,737	$2,597	7.1%
Oglethorpe	$13,547	$18,646	5.4%	$1,960	$3,021	7.7%
Rabun	$13,062	$19,927	7.5%	$2,889	$4,970	10.3%
Stephens	$14,068	$19,690	5.7%	$2,799	$4,642	9.4%
Towns	$13,297	$19,422	6.6%	$3,243	$5,780	11.2%
Union	$12,793	$18,402	6.3%	$2,944	$5,018	10.1%
Walker	$13,321	$17,856	4.9%	$2,558	$4,002	8.1%
White	$15,649	$21,650	5.5%	$2,682	$3,868	6.3%
Whitfield	$17,053	$23,580	5.5%	$1,984	$3,183	8.6%
Forest Area						
County Average	$14,261	$19,724	5.5%	$2,346	$3,735	8.5%

Note: Dollars are in nominal terms (year of occurrence)

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System database

Table B-74. County Employment and Unemployment Rate –1997

	Employment	Unemployment Rate
County/State	**1997**	**1997**
State Of Georgia	3,729,953	4.5%
Georgia Counties With Forest Service Ownership		
BANKS	5,741	5.3%
CATOOSA	23,893	4.0%
CHATTOOGA	11,469	4.9%
DAWSON	10,513	2.8%
FANNIN	7,991	7.3%
FLOYD	43,917	4.7%
GILMER	7,830	6.5%
GORDON	20,445	5.6%
GREENE	5,312	6.4%
HABERSHAM	14,382	5.1%
HALL	65,288	3.0%
JASPER	4,726	5.5%
JONES	11,374	3.7%
LUMPKIN	9,235	3.1%
MORGAN	6,808	4.4%
MURRAY	17,190	5.5%
OCONEE	12,231	2.0%
OGLETHORPE	4,985	4.5%
RABUN	6,717	3.3%
STEPHENS	12,286	5.6%
TOWNS	3,219	10.4%
UNION	6,617	5.9%
WALKER	28,902	5.5%
WHITE	8,996	4.2%
WHITFIELD	44,744	4.0%
Forest Area		
Total	320,433	4.5%
Average	15,792	4.5%

Source: U.S. Bureau of Labor Statistics Local Area Unemployment

Table B-75. Diversity of the Chattahoochee-Oconee NF Area Economy by Sector –1985 and 1996.

Industry	Industry Output*	Percent of Total	Industry Output*	Percent of Total	Employ-ment	of Total	Employ-ment	Percent of Total	Total Income	Percent of Total	Total Income	Percent of Total
	1985		1996		1985				1985		1996	
Agriculture	1,403	7.6%	1,659	4.8%	14,125	5.5%	14,298	4.8%	$407	5.5%	$549	3.8%
Mining	65	0.4%	72	0.2%	985	0.4%	667	0.2%	$29	0.4%	$39	0.3%
Construction	890	4.8%	2,110	6.1%	14,057	5.4%	26,622	6.1%	$358	4.9%	$755	5.2%
Other Manufacturing	9,507	51.3%	16,545	47.9%	89,962	34.8%	109,233	47.9%	$2,433	33.1%	$4,863	33.2%
Mfg.--SIC 24 Lumber & Wood Prods.	348	1.9%	433	1.3%	4,881	1.9%	3,717	1.3%	$115	1.6%	$169	1.2%
Mfg.--SIC 25 Wood Furniture & Fixtures	71	0.4%	142	0.4%	1,461	0.6%	1,538	0.4%	$27	0.4%	$46	0.3%
Mfg.--SIC 26 Paper & Pulp Products	219	1.2%	371	1.1%	1,547	0.6%	1,347	1.1%	$77	1.0%	$120	0.8%
Total Manufacturing	10,144	54.7%	17,491	50.7%	97,851	37.8%	115,835	50.7%	$2,652	36.1%	$5,198	35.5%
Transportation & Utilities--Non-Tourism	884	4.8%	1,716	5.0%	9,637	3.7%	11,839	5.0%	$483	6.6%	$860	5.9%
Finance, Insurance, Real Estate	752	4.1%	2,705	7.8%	10,736	4.2%	16,486	7.8%	$445	6.0%	$1,688	11.5%
Services--Non-Tourism	1,090	5.9%	3,562	10.3%	28,689	11.1%	76,050	10.3%	$676	9.2%	$2,037	13.9%
Wholesale & Retail Trade--Non-Tourism	1,715	9.3%	3,069	8.9%	39,865	15.4%	70,011	8.9%	$928	12.6%	$1,726	11.8%
Recreational Related Wholesale	6	0.0%	0	0.0%	88	0.0%	0	0.0%	$4	0.1%	$0	0.0%
Recreational Related Retail Trade	16	0.1%	0	0.0%	460	0.2%	0	0.0%	$9	0.1%	$0	0.0%
Local, Interurban Passenger Transit	2	0.0%	4	0.0%	34	0.0%	130	0.0%	$1	0.0%	$3	0.0%
Recreation Related Industries:												
Air Transportation	2	0.0%	12	0.0%	15	0.0%	124	0.0%	$1	0.0%	$6	0.0%
Wholesale & Retail Trade	75	0.4%	95	0.3%	1,655	0.6%	1,465	0.3%	$43	0.6%	$53	0.4%
General Merchandise Stores	0	0.0%	10	0.0%	0	0.0%	364	0.0%	$0	0.0%	$6	0.0%
Food Stores	0	0.0%	13	0.0%	0	0.0%	484	0.0%	$0	0.0%	$9	0.1%
Eating & Drinking	51	0.3%	96	0.3%	1,454	0.6%	2,826	0.3%	$18	0.2%	$42	0.3%
Miscellaneous Retail	0	0.0%	15	0.0%	0	0.0%	516	0.0%	$0	0.0%	$10	0.1%
Hotels and Lodging Places	31	0.2%	55	0.2%	886	0.3%	1,071	0.2%	$18	0.2%	$27	0.2%

Table continued next page.

Industry	Industry Output*	Percent of Total	Industry Output*	Percent of Total	Employ-ment	Percent of Total	Employ-ment	Percent of Total	Total Income	Percent of Total	Total Income	Percent of Total
	1985		1996		1985		1996		1985		1996	
Laundry, Cleaning and Shoe Repair	4	0.0%	7	0.0%	217	0.1%	282	0.0%	$3	0.0%	$4	0.0%
Automobile Rental and Leasing	5	0.0%	5	0.0%	60	0.0%	44	0.0%	$2	0.0%	$2	0.0%
Automobile Repair and Services	10	0.1%	20	0.1%	169	0.1%	269	0.1%	$4	0.1%	$8	0.1%
Amusement and Recreation Services, N.E.C.	4	0.0%	15	0.0%	186	0.1%	537	0.0%	$2	0.0%	$8	0.1%
Total Tourism Estimate	205	1.1%	345	1.0%	5,224	2.0%	8,113	1.0%	$104	1.4%	$178	1.2%
Government	1,351	7.3%	1,750	5.1%	34,810	13.5%	50,379	5.1%	$1,236	16.8%	$1,568	10.7%
Other--Misc.	32	0.2%	32	0.1%	2,718	1.1%	3,585	0.1%	$32	0.4%	$32	0.2%
Totals	18,530	100.0%	34,512	100.0%	258,697	100.0%	393,886	100.0%	$7,349	100.0%	$14,630	100.0%

Table B-76. Shannon-Weaver Entropy Indices

Georgia Counties	1977 Four Digit SIC	1993 Four Digit SIC
BANKS	0.3233	0.52527
LUMPKIN	0.3367	0.57985
CHATTOOGA	0.34921	0.51019
FANNIN	0.39017	0.57981
DAWSON	0.39827	0.57933
MURRAY	0.4101	0.45828
WHITFIELD	0.44293	0.54317
RABUN	0.44769	0.58966
CATOOSA	0.44822	0.59717
WHITE	0.45805	0.58398
UNION	0.46635	0.58629
OGLETHORPE	0.48494	0.59696
JONES	0.48542	0.57499
GORDON	0.48576	0.56993
JASPER	0.49084	0.56387
TOWNS	0.49632	0.56489
GILMER	0.49683	0.56044
MORGAN	0.50384	0.60786
GREENE	0.51083	0.57291
OCONEE	0.51627	0.61683
HABERSHAM	0.52043	0.59558
WALKER	0.52825	0.59542
STEPHENS	0.57592	0.63723
FLOYD	0.59872	0.6556
HALL	0.60665	0.67032
GEORGIA	0.62443	0.71644
UNITED STATES	0.66483	0.73973

Table B-77. Net Exports – Chattahoochee-Oconee NF Area Economy –1985 and 1996.

	Net Exports		Net Exporting Industries as a Percentage of Total Positive Exporting Industries	
Commodity	1985	1996		
Agriculture	$453.70	$511.30	16.7%	13.3%
Mining	($676.80)	($744.10)	0.0%	0.0%
Construction	($97.70)	($53.50)	0.0%	0.0%
Mfg.--SIC 23 Lumber & Wood Products	$141.20	$101.10	5.2%	2.6%
Mfg.--SIC 25 Wood Furniture & Fixtures	($2.20)	($35.90)	0.0%	0.0%
Mfg.--SIC 26 Paper & Pulp Products	($119.10)	($173.40)	0.0%	0.0%
Other Manufacturing	$1,783.40	$3,238.80	65.6%	84.0%
Total Manufacturing	$1,803.30	$3,130.60	66.3%	81.2%
Commodities Existing in Tourism Estimate:				
Local, Interurban Passenger Transit	($3.90)	($48.20)	0.0%	0.0%
Air Transportation	($136.60)	($169.30)	0.0%	0.0%
Recreation Related Wholesale Trade	($4.30)	$0.00	0.0%	0.0%
Recreation Related Retail Trade	($9.70)	$0.00	0.0%	0.0%
General Merchandise Stores	$0.00	($51.60)	0.0%	0.0%
Food Stores	$0.00	($81.20)	0.0%	0.0%
Eating & Drinking	($61.30)	($49.10)	0.0%	0.0%
Miscellaneous Retail	$0.00	($82.00)	0.0%	0.0%
Hotels and Lodging Places	($25.10)	($135.30)	0.0%	0.0%
Laundry, Cleaning and Shoe Repair	$10.90	$6.40	0.4%	0.2%
Automobile Rental and Leasing	($9.10)	($45.60)	0.0%	0.0%
Automobile Repair and Services	($62.60)	($74.30)	0.0%	0.0%
Amusement and Recreation Services	($15.30)	($68.30)	0.0%	0.0%
Total for Commodities in Tourism Est. (Except 433,447,456,465)	($303.10)	($798.40)	0.0%	0.0%
Estimate of Trade in Tourism **	($27.30)	($71.90)	0.0%	0.0%
Transportation & Utilities (433)	($512.20)	($867.00)	0.0%	
Wholesale & Retail Trade--Non-Tourism (447)	($383.90)	($1,020.40)	0.0%	0.0%
Finance, Insurance, and Real Estate (456)	($1,287.20)	($1,830.70)	0.0%	0.0%
Services--Non-Tourism (465)	($1,030.00)	($1,890.30)	0.0%	0.0%
Total of Commodities 433, 447, 456, 465	($3,213.30)	($5,608.40)	0.0%	0.0%
Government	$329.20	($55.70)	12.1%	0.0%
Other--Miscellaneous	($159.30)	($178.00)	0.0%	0.0%
Total Net Trade (Exports)	($1,864.10)	($3,796.20)	100.0%	100.0%
Total Positive Trade Industries (Exports)	$2,718.40	$3,857.60		

NOTE: 1996 IMPLAN did not have Recreation Related Wholesale and Retail Trade.

Source: 1985 and 1996 IMPLAN Data

Table B-78. Payment in Lieu of Taxes to Counties –1990, 1997 and 1999

	Payments			% Change	Percent Change	
	1990	1997	1999	1990-99	1990-97	1997-99
State of Georgia	$651,390					
Georgia Counties With Forest Service Ownership						
Banks	$303	$307	$393	29.7%	1.3%	28.0%
Catoosa	$2,986	$2,893	$2,989	0.1%	-3.1%	3.3%
Chattooga	$8,989	$9,148	$11,720	30.4%	1.8%	28.1%
Dawson	$5,390	$5,282	$6,248	15.9%	-2.0%	18.3%
Fannin	$49,381	$50,050	$64,129	29.9%	1.4%	28.1%
Floyd	$3,075	$3,124	$4,002	30.1%	1.6%	28.1%
Gilmer	$30,001	$30,642	$37,657	25.5%	2.1%	22.9%
Gordon	$3,798	$3,853	$4,926	29.7%	1.4%	27.8%
Greene	$2,683	$17,113	$12,218	355.4%	537.8%	-28.6%
Habersham	$18,676	$18,807	$24,099	29.0%	0.7%	28.1%
Hall	$24,305	$23,659	$24,438	0.5%	-2.7%	3.3%
Jasper	$2,698	$18,350	$13,097	385.4%	580.1%	-28.6%
Jones	$1,648	$10,071	$7,067	328.8%	511.1%	-29.8%
Lumpkin	$26,746	$27,189	$34,749	29.9%	1.7%	27.8%
Morgan	$43	$265	$189	339.5%	516.3%	-28.7%
Murray	$25,799	$26,866	$33,164	28.5%	4.1%	23.4%
Oconee	$16	$97	$0	100.0%	506.3%	100.0%
Oglethorpe	$376	$2,324	$1,659	341.2%	518.1%	-28.6%
Rabun	$68,701	$70,128	$89,842	30.8%	2.1%	28.1%
Stephens	$14,076	$13,660	$16,838	19.6%	-3.0%	23.3%
Towns	$26,523	$27,470	$34,554	30.3%	3.6%	25.8%
Union	$45,333	$46,062	$58,927	30.0%	1.6%	27.9%
Walker	$9,918	$10,071	$12,590	26.9%	1.5%	25.0%
White	$19,221	$19,441	$24,956	29.8%	1.1%	28.4%
Whitfield	$5,447	$5,529	$7,084	30.1%	1.5%	28.1%
Forest Area						
Totals	$396,132	$442,401	$527,535	33.20%	11.7%	19.2%
% of State Totals	60.8%					

Source: National Resource Information System

Table B-79. Twenty-Five Percent Fund Payments by County with National Forest Lands – 1986, 1990, 1992, 1995 and 1997

Georgia Counties	1986	1990	1992	1995	1997	% Change
BANKS	$456	$306	$592	$618	$457	0.1%
CATOOSA	$4	$3	$5	$6	$4	1.0%
CHATOOGA	$13,464	$9,119	$17,674	$18,432	$13,619	1.1%
DAWSON	$4,789	$3,263	$6,162	$6,426	$4,748	-0.9%
FANNIN	$74,579	$50,092	$96,836	$100,840	$74,525	-0.1%
FLOYD	$4,607	$3,120	$6,035	$6,294	$4,650	0.9%
GILMER	$37,913	$25,864	$50,000	$52,149	$38,176	0.7%
GORDON	$5,624	$3,808	$7,361	$7,677	$5,672	0.9%
GREENE	$153,389	$135,646	$131,985	$11,169	$41,378	-73.0%
HABERSHAM	$27,885	$18,952	$36,337	$37,892	$28,006	0.4%
JASPER	$157,772	$136,425	$136,394	$11,933	$44,358	-71.9%
JONES	$95,673	$83,302	$79,645	$6,573	$24,351	-74.5%
LUMPKIN	$40,207	$26,782	$51,810	$54,129	$39,995	-0.5%
MONROE	$0	$0	$0	$101	$373	N/A
MORGAN	$2,477	$2,169	$2,097	$173	$641	-74.1%
MURRAY	$35,465	$24,013	$46,421	$48,410	$36,070	1.7%
OCONEE	$647	$794	$767	$63	$235	-63.7%
OGLETHORPE	$21,721	$19,020	$18,390	$1,517	$5,619	-74.1%
PUTNAM	$199,373	$177,494	$173,618	$14,994	$55,551	-72.1%
RABUN	$103,382	$69,879	$135,499	$141,357	$104,513	1.1%
STEPHENS	$15,582	$10,994	$21,242	$22,153	$16,368	5.0%
TOWNS	$39,671	$26,903	$52,415	$54,696	$40,414	1.9%
UNION	$66,738	$46,133	$89,186	$93,027	$68,737	3.0%
WALKER	$12,912	$8,852	$17,113	$17,847	$13,236	2.5%
WHITE	$29,623	$19,355	$37,601	$39,213	$28,979	-2.2%
WHITFIELD	$8,164	$5,526	$10,682	$11,140	$8,231	0.8%
Forest Area						
Total	$1,152,117	$907,816	$1,225,869	$758,829	$698,906	-39.3%
Average	$46,085	$36,313	$49,035	$30,353	$27,956	

N/A = Not Applicable or Not Available

Source: USDA Forest Service, Rocky Mountain Research Station

Table B-80. Land-Use Percent in Counties with Forest Service Ownership –1982 and 1992.

		% Share							
	Acres	Forest		Farm		Urban		Other	
Georgia Counties			1992	1982	1992	1982	1992	1982	1992
BANKS	149,568	20.5%	18.9%	72.7%	73.3%	2.5%	3.4%	4.3%	4.5%
CATOOSA	103,808	36.2%	32.2%	42.8%	39.0%	10.6%	17.1%	10.4%	11.8%
CHATTOOGA	200,832	28.0%	25.4%	54.5%	54.6%	6.3%	7.3%	11.2%	12.7%
DAWSON	135,040	1.2%	2.3%	71.8%	69.0%	1.0%	1.6%	26.0%	27.1%
FANNIN	246,912	7.5%	7.9%	44.3%	42.1%	2.2%	3.7%	46.1%	46.3%
FLOYD	328,512	23.4%	22.9%	63.4%	62.3%	6.6%	7.9%	6.7%	6.9%
GILMER	273,088	4.4%	3.4%	71.9%	71.4%	0.1%	0.4%	23.7%	24.8%
GORDON	227,328	34.1%	29.9%	51.6%	50.5%	6.2%	10.5%	8.1%	9.1%
GREENE	248,576	15.3%	15.3%	68.0%	67.2%	1.7%	2.1%	15.0%	15.5%
HABERSHAM	178,048	21.9%	22.2%	48.1%	46.2%	3.4%	4.6%	26.7%	27.0%
HALL	251,968	24.3%	24.0%	45.3%	42.0%	9.4%	10.7%	21.1%	23.4%
JASPER	237,120	15.9%	16.0%	64.0%	63.6%	1.1%	2.2%	19.1%	18.3%
JONES	252,032	20.4%	20.3%	55.8%	54.8%	3.2%	4.0%	20.7%	20.9%
LUMPKIN	182,080	12.6%	11.8%	52.9%	52.6%	1.0%	2.1%	33.4%	33.6%
MORGAN	223,808	37.6%	36.2%	53.1%	52.6%	2.6%	3.4%	6.6%	7.9%
MURRAY	220,416	11.3%	10.4%	57.4%	52.7%	2.7%	5.7%	28.6%	31.2%
OCONEE	118,912	21.3%	18.5%	64.5%	62.5%	4.9%	9.9%	9.3%	9.1%
OGLETHORPE	282,304	19.2%	18.1%	76.7%	76.1%	0.1%	0.0%	4.1%	5.9%
RABUN	237,504	2.0%	1.5%	30.3%	29.8%	3.5%	4.5%	64.2%	64.3%
STEPHENS	114,752	17.0%	15.5%	47.5%	48.0%	1.4%	1.9%	34.1%	34.6%
TOWNS	106,560	8.6%	8.0%	29.8%	28.3%	4.1%	6.0%	57.5%	57.7%
UNION	206,528	14.0%	15.0%	34.4%	29.9%	1.5%	3.5%	50.1%	51.6%
WALKER	285,632	24.1%	21.3%	49.4%	51.1%	9.4%	10.8%	17.2%	16.8%
WHITE	154,624	14.8%	14.8%	52.6%	52.3%	0.9%	1.0%	31.8%	31.9%
WHITFIELD	185,600	14.9%	15.0%	64.7%	58.1%	8.8%	15.0%	11.6%	11.9%
Total	**5,151,552**								
Forest Area Weighted Av.		18.0%	17.2%	55.3%	53.9%	3.8%	5.4%	22.8%	23.6%

Source: Natural Resource Information System

Table 3-79. Estimated Decade 1 Average Annual Budget by Alternative in Year 2000 Dollars

Program or Activity	Alt A	Alt. B	Alt. D	Alt. E	Alt. F	Alt. G	
Timber:							
Timber Direct	3,362	5,222	6,257	545	8,728	36	3,676
Timber Overhead	673	1,044	1,251	109	1,745	7	735
Roads/Engineering:							
Timber Roads	68	105	132	10	144	3	13
Other Roads/Engineering	1,219	1,176	1,145	1,285	1,132	1,294	1,214
Recreation	2,135	2,135	2,135	2,135	2,135	2,135	2,135
Wildlife	790	790	790	790	790	790	790
Soil, Water & Air	742	742	742	742	742	742	742
Protection/Forest Health	2,056	2,056	2,056	2,056	2,056	2,056	2,056
Lands	495	495	495	495	495	495	495
Range	5	5	5	5	5	5	5
Minerals	5	5	5	5	5	5	5
Planning, Inv., Monitoring	1,049	1,049	1,049	1,049	1,049	1,049	1,049
	12,598	14,824	16,062	9,227	19,026	8,616	12,915

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