



United States  
Department of  
Agriculture

Forest Service

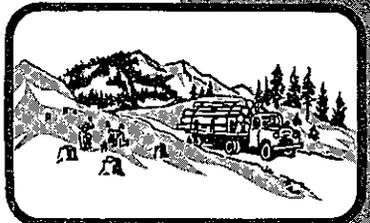
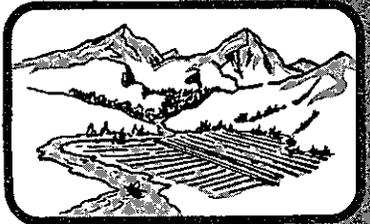
Delta, Colorado



# FINAL ENVIRONMENTAL IMPACT STATEMENT

## GRAND MESA, UNCOMPAHGRE, AND GUNNISON NATIONAL FORESTS

Volume 1  
Summary, Chapters I-V



FINAL ENVIRONMENTAL IMPACT STATEMENT  
FOR  
GRAND MESA, UNCOMPAHGRE AND GUNNISON NATIONAL FORESTS  
LAND AND RESOURCE MANAGEMENT PLAN

FINAL ENVIRONMENTAL IMPACT STATEMENT  
FOR  
GRAND MESA, UNCOMPAHGRE, AND GUNNISON  
NATIONAL FORESTS  
LAND AND RESOURCE MANAGEMENT PLAN

02-04-82-05

Delta, Garfield, Gunnison, Hinsdale, Mesa, Montrose,  
Ouray, Saguache, San Juan, and San Miguel Counties, Colorado

Type of Action: Administrative                      Lead Agency:      USDA,      Forest      Service

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Abstract: This Final Environmental Impact Statement (EIS) describes a Proposed Action and alternatives for managing 2,905,027 acres of National Forest System land. The alternatives are: 1, Emphasis on a mixture of outputs, a portion of Cannibal Plateau Further Planning Area (CPFPA) is suitable for wilderness, Fossil Ridge Wilderness Study Area (FRWSA), is unsuitable for wilderness; 2, Emphasis on continuation of current management, CPFPA and FRWSA are unsuitable for wilderness; 3, Outputs identified in Forest and Rangeland Renewable Resources Planning Act and Regional Guide, CPFPA and FRWSA are unsuitable for wilderness; 4, Emphasis on non-market outputs, all of CPFPA and FRWSA are suitable for wilderness; 5, Emphasis on market outputs, CPFPA and FRWSA are unsuitable for wilderness; 6, Emphasis on recreation and wilderness management, portions of CPFPA and FRWSA are suitable for wilderness; 7, Emphasis on range and timber management, all of CPFPA and FRWSA are suitable for wilderness; 8, Emphasis on water augmentation, a portion of CPFPA, is suitable for wilderness, FRWSA, is unsuitable for wilderness; 9, Emphasis on maintaining the current mix of outputs under a 25% reduced budget, CPFPA and FRWSA are unsuitable for wilderness.

Alternative 1 is the Forest Service Proposed Action.

GRAND MESA, UNCOMPAHGRE, AND GUNNISON NATIONAL FORESTS  
 LAND AND RESOURCE MANAGEMENT PLAN  
 FINAL ENVIRONMENTAL IMPACT STATEMENT

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## Summary

## SUMMARY OF FINAL ENVIRONMENTAL IMPACT STATEMENT

This Final Environmental Impact Statement (EIS) discloses the environmental consequences of implementing the Proposed Action and the alternatives to it. The alternatives were developed in preparation of the Forest Land and Resource Management Plan (the Plan) for the Grand Mesa, Uncompahgre, and Gunnison National Forests (the Forest). The Record of Decision attached to this Final EIS discloses the rationale for the decision which approves the Grand Mesa, Uncompahgre and Gunnison National Forest's Plan.

### PURPOSE AND NEED

The purpose of the Plan is to address local, regional, and national issues related to National Forest management; to define a mix of management activities that will promote the sustained use and protection of forest resources; guides development of multi-year implementation programs for the Supervisor's Office and Ranger Districts; and provides direction to the Supervisor's Office and Ranger Districts for identifying activities and expenditures to achieve on-the-ground results. The Plan is needed to address the conflicting desires between forest user groups. There is a need to resolve these conflicts, and to update and display information in one Plan that integrates management direction for all forest resources. The Plan provides a management program reflecting a mix of management activities to achieve a healthy, vigorous forest environment. The environment must be capable of supporting a wide range of natural processes and human activities. Vegetation treatment is the major tool the Forest utilizes to achieve this overall goal. The Record of Decision attached to this Final EIS discloses the rationale for the decision in the Grand Mesa, Uncompahgre, and Gunnison National Forest Plan.

The preparation of an EIS is required by the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, and implementing regulations of the National Forest Management Act (NFMA). Preparation of the Plan is required by the Forest and Rangeland Renewable Resources Planning Act (RPA) as amended by NFMA.

The key element for achieving the goals and objectives of this Plan is a healthy Forest. The Plan and Final EIS discuss numerous needs and rationales for using vegetation treatment as one of the most practical and efficient methods of achieving many goals and objectives. Vegetation treatment is a management technique in administering the multiple-use resources of the National Forest to attain the overall goal of a healthy, vigorous forest. It is used to adjust existing plant communities to best meet the vegetation needs and resource goals and objectives. Vegetation treatment is accomplished without impairment of land productivity and is guided by the Management Requirements of the Plan in all alternatives.

When vast acreages of forest cover are uniformly mature, wildlife diversity is limited to relatively few species dependent on mature forests. Burning, cutting, or other vegetation treatment activities will increase vegetation diversity which will provide wildlife habitat diversity. Treatment also reduces the amounts of unwanted fuels. Mature and overmature forests are more susceptible to epidemic insect attack. The attack can spread over large areas creating undesirable effects similar to large burns or clearcuts. If age, size class, and species diversity is enhanced the risk of wide spread epidemic

is reduced. Water yield increases also depend on forest resource management. Other outputs and effects as diverse as maintaining visual quality and firewood availability are closely related to the amount of vegetation treated.

Costs associated with vegetation treatment and other activities necessary to achieve goals stated in the alternatives are significant. It is often difficult to justify vegetation treatment expense to achieve goals associated with visual quality maintenance, cultural resource discovery, wildlife habitat improvement, insect and disease prevention, water yield improvement or commercial timber harvest. Doing so may maximize the use of some resources but reduce the total outputs and long-term potential of other resource uses. Individually the costs are too great and the long-term benefits too small. By applying an integrated approach to management the overall goals are cost-efficient. For example, timber harvest in aspen enhances wildlife habitat diversity visual quality, and returns dollars to the U.S. Treasury. This approach has the added benefit of maintaining existing employment in communities dependent on the timber industry.

In other cases, prescribed burning, firewood removal, or cutting by Forest Service crews and volunteers may be the most efficient way to treat vegetation. Vegetation treatment levels vary by alternative due to the alternatives emphasis.

Vegetation treatment can require road construction. Roads take land out of production and impact the soil and water resources. However, Management Requirements in the Plan, Chapter III, ensure impacts are short-term in all alternatives. An environmental analysis occurs before road construction. Considerations are given to the physical and biological land characteristics as well as the goals of the management area in determining how and where to construct the road. These characteristics include slope, soil erodibility, vegetation cover, wildlife and fisheries protection, stream proximity and visual resource protection. Road use by people, rather than the actual road itself, causes greater impacts on the environment and on other resource uses and activities. Effective travel management provides resource protection and a safe, environmentally sound, and efficient transportation system. Travel management directs use of existing and future roads in all alternatives. In some areas, no roads will be built. In others, roads will be built, but their use will be restricted. In other instances, roads will be open to public use.

As an example, road construction can open up a previously unroaded area. Road use in this area can impact wildlife seclusion and semi-primitive non-motorized recreation opportunities. Travel management may restrict or close roads leading to, or in, the area based on the goals of the management areas through which the road passes. This road closure or restriction can restore wildlife seclusion, continue semi-primitive non-motorized recreation opportunities but with improved non-motorized access to the area, improve access for other resource activities, prevent unacceptable resource damage and reduce maintenance costs. Public understanding of management area and travel management goals is necessary for public acceptance of area and road closures or restrictions. Additional discussion of travel management is displayed in Chapter III under the "Facilities" section.

The Colorado Wilderness Act (P.L. 96-560) directs the Forest Service to assess Fossil Ridge Wilderness Study Area for inclusion in the National Wilderness Preservation System. The Act retains the RARE II designation for Cannibal Plateau Further Planning Area. Wild and Scenic River Eligibility Reports were prepared for the East River and Taylor River.

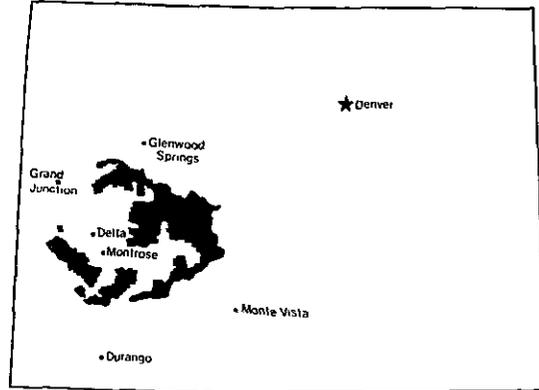
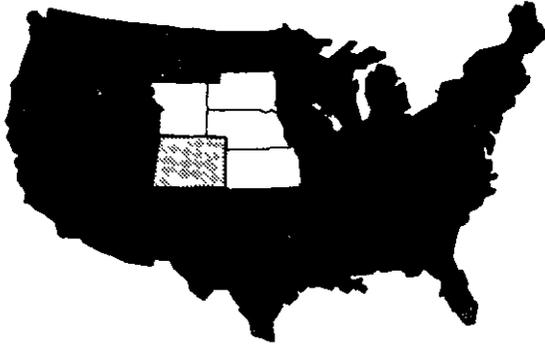
There are 2,953,186 acres of National Forest System land comprising the Grand Mesa (346,141 acres), Uncompahgre (944,241 acres) and Gunnison National Forests (1,662,804 acres). Figure 1 is a vicinity map displaying land administered by the Forest.

FIGURE 1.

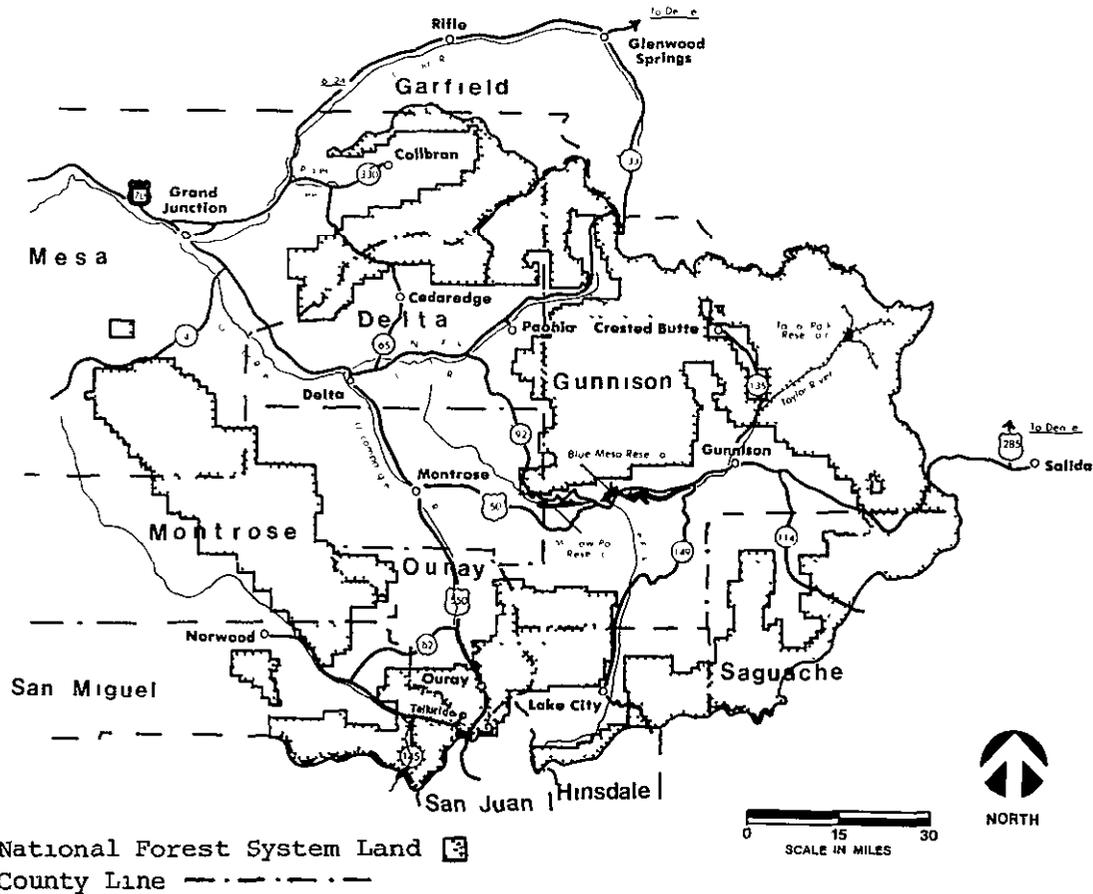
VICINITY MAP  
 (Grand Mesa, Uncompahgre, and Gunnison National Forests)

Region 2, Forest Service,  
 United States Department of Agriculture

The State of Colorado



Grand Mesa, Uncompahgre & Gunnison National Forests



The Plan and Final EIS address public issues and management concerns related to Forest management. These issues and concerns were analyzed and summarized into seventeen Forest planning questions.

The planning questions are an integral part of the planning process. They are linked to alternative development and evaluation. These planning questions, and the requirements of the NFMA regulations, established the scope of the Plan and its Final EIS. The planning questions are:

PLANNING QUESTION 1: How much and what types of recreation opportunities should the Grand Mesa, Uncompahgre, and Gunnison National Forests provide?

PLANNING QUESTION 2: How much roadless, non-wilderness recreation opportunity should the Forest provide and where should it be located?

PLANNING QUESTION 3: What type of wilderness management is needed to maintain the quality of the recreation experience in existing and proposed wilderness areas?

PLANNING QUESTION 4: Should Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area be recommended for inclusion in the National Wilderness Preservation System?

PLANNING QUESTION 5: How much habitat (forage, cover, water) should be available for wildlife and fish?

PLANNING QUESTION 6: Where and how much forage should be allocated to big game use?

PLANNING QUESTION 7: Where and how much forage should be allocated to livestock use?

PLANNING QUESTION 8: How should Forest products be managed to supply commercial and non-commercial demands on the Forest?

PLANNING QUESTION 9: What surface resource uses should be permitted in municipal watersheds?

PLANNING QUESTION 10: How should the Forest respond to increasing demands for water?

PLANNING QUESTION 11: How should the Forest coordinate mineral development activity with other resource values?

PLANNING QUESTION 12: What type of transportation system is necessary to manage the Forest and its resources?

PLANNING QUESTION 13: How should the Forest handle the problems caused by private land within and adjacent to the National Forest?

PLANNING QUESTION 14: Where should the Forest provide utility corridors and how should they be managed?

PLANNING QUESTION 15: Can service to the public and administration be improved with Forest or District boundary changes?

PLANNING QUESTION 16: How should the Forest manage significant cultural resources (and other special interest areas)?

PLANNING QUESTION 17: How should the Forest manage the visual resource?

#### WILDERNESS DIRECTION

The Final EIS discloses alternative management direction for 2,905,027 acres of National Forest System land. This acreage includes all of the La Garita and Raggeds Wildernesses. This Final EIS does not disclose alternative management direction for the Lizard Head, Collegiate Peaks and Maroon Bells-Snowmass wildernesses. Table 1 summarizes the area covered by the Final EIS and Forest Plan.

Management direction was established cooperatively between this Forest and the San Juan, White River, and Rio Grande National Forests to ensure uniform management within a single wilderness area. Each Forest will continue to administer their respective portions of the wilderness areas.

TABLE 1.

#### ACREAGE SUMMARY

Area	Acres
Total Grand Mesa, Uncompahgre, and Gunnison National Forest System Land	2,953,186
Forest Wilderness Acres Disclosed in Other Forest EIS's	88,901
Net Grand Mesa, Uncompahgre, and Gunnison National Forest System Land Disclosed in This EIS	2,864,285
Other Forest Wilderness Acres Disclosed in This EIS	40,742
Total National Forest System Land Disclosed in This EIS	2,905,027

The Final EIS discloses management alternatives and their potential impacts on the five wilderness areas displayed in Table 2.

TABLE 2.

WILDERNESSES COVERED IN THIS FINAL EIS  
(Acres)

Name	Net N.F. Acres
Big Blue Wilderness	98,235
La Garita Wilderness (including 24,164 acres administered by the Rio Grande N.F.)	103,986
Mount Sneffels Wilderness	16,200
Raggeds Wilderness (includes 16,578 acres administered by the White River N.F.)	59,105
West Elk Wilderness	176,092
GRAND TOTAL	453,618

The San Juan National Forest's Final EIS will disclose alternative management direction for the entire Lizard Head Wilderness. This includes 20,342 acres managed by this Forest. The White River National Forest will disclose alternative management direction for the Maroon Bells-Snowmass Wilderness and the Collegiate Peaks Wilderness. This includes 19,598 acres and 48,961 acres respectively, managed by this Forest.

#### CHANGES BETWEEN DRAFT AND FINAL EIS

The Draft EIS and Proposed Plan were filed with the EPA October 25, 1982. Subsequently nine open house meetings and two public hearings were conducted. Numerous articles were published in local and regional newspapers. Forest officials made radio and television appearances discussing the Proposed Plan.

Members of the public and other government agencies commented on the Draft EIS and Proposed Plan. A total of 249 government and non-government letters, 73 hearing statements and two government resolutions were received. The comments on the Draft EIS and Proposed Plan covered a variety of topics. Comments and Forest Service response are displayed in Chapter VI of the Final EIS.

Separate legislative EIS' for Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area will be prepared. The legislative EIS' will be submitted to the Washington Office of the Forest Service. The Regional Forester's recommendation will receive further review and possible modification in the offices of the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States.

The Proposed Plan was prepared under the 1979 NFMA implementing regulations. In November 1982 revised regulations became effective. The revised regulations contain provisions for a transition period. The revised regulations (36 CFR 219.29(b)(1)) state: "If prior to the effective date of an amendment to this subpart, a forest plan either has been approved in final form or released in draft form for public review, the plan need not be modified to incorporate requirements of such amendment, until the next scheduled revision of the forest plan."

The Proposed Plan was filed prior to the 1982 regulations effective date. When the Grand Mesa, Uncompahgre and Gunnison National Forests Plan is scheduled to be revised it will be brought into conformance with the 1982 regulations.

The Final EIS and Plan have been revised, where practicable, to meet the intent of the 1982 regulations. The 1982 regulations changed the name of the Regional Plan to Regional Guide. The proposed Rocky Mountain Regional Plan referenced in the Draft EIS is now referred to as the Rocky Mountain Regional Guide. The Regional Guide and Final EIS were filed with the Environmental Protection Agency on June 1, 1983.

Content has been revised in this Final EIS to reflect new data, revised management direction and implementing schedules, public comments and goal clarification. Some commentators disagreed with data or analysis displayed in the Draft EIS. These are considered opposing views under the NEPA regulations. Opposing views have been appropriately incorporated throughout the Final EIS. The responsible official will consider these opposing views when making his final decision. Opposing views that have been added to the Final EIS include:

- Constraints on Benchmark analysis give inaccurate results and make them inappropriate for comparison;
- Disagree with data analysis and display for Fossil Ridge Wilderness Study Area and/or Cannibal Plateau Further Planning Area.
- The management indicator species list is too limited;
- The criteria for determining capable timber land is too low;
- Timber harvest levels are too high;
- Timber harvest levels are too low;
- Clearcutting to increase water yield will cause erosion and turbidity impacts;
- Harvesting timber to increase water yield is shortsited and is being used to rationalize timber harvest levels;
- The fifty year proposed water projections are too high;
- The Proposed Plan will destroy the tourist industry for Gunnison County;
- Downhill skiing demand projections are too high;
- Timber should be managed for unevenaged stands;
- Mineral leasing should not be permitted on slopes over 40%;
- Utility corridors are not discussed in any of the alternatives;
- Discount rates used in the economic analysis are too low; and
- The Proposed Plan will prevent economic development in the planning area.

The set of Management Prescriptions has been revised to respond to public comments and management concerns. Prescriptions 6C and 6D have been deleted.

These prescriptions duplicated Management Direction in a number of other prescriptions and the Forest Direction. Management Prescriptions 5A and 5B were added to make winter range management more site specific. Public and management alike were confused on the location of winter range direction in the Plan. Prescription 7F has been combined with Prescription 7E. Riparian area management is displayed in Prescription 9A in the Final EIS. It was included in Forest Direction in the Draft EIS. Prescription 9B is now displayed on alternative maps. Prescription 10E was added for the Fruita Division Municipal Watershed. Maps have been revised to respond to public comments on the Draft EIS and to management concerns.

In Chapter II, in the section 'Alternatives Considered and Eliminated from Detailed Study', the Departure from Base Sale Schedule has been revised. The Departure displayed in the Final EIS was developed to respond to a local comment requesting the timber harvest schedule be accelerated.

The importance of vegetation on the Forest has been highlighted. Alternatives in Chapter II have vegetation treatment goals. Chapter III displays current vegetation conditions and what will happen to the vegetation with and without treatment. Chapter IV displays how vegetation treatment and timber management contribute to a healthy Forest. Timber management contributions to other resources are displayed in Chapter IV. Some goals were reworded and new goals added to clarify management direction.

The Draft EIS was designed to respond to 17 planning questions developed during the Forest planning process. Public comments on the Draft EIS are organized by these planning questions and displayed in Chapter IV. In addition to the planning questions, comments on seven other topics are displayed in Chapter IV. These topics are:

Alternative Selection	Monitoring
Benchmark/NEPA Process	Prescriptions
Miscellaneous	Research
Social, Economic, Net Public Benefits.	

#### ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter is the heart of the Final EIS. It describes and compares the range of alternatives analyzed in the Forest planning process, including the Proposed Action. The NFMA regulations include criteria to guide alternative development. Nine alternatives, including the Proposed Action, are considered in detail. Each alternative meets NFMA feasibility requirements. They are economically, technically, budgetarily, and environmentally feasible and reasonable. Each alternative addresses the set of planning questions differently. Each contains different goals and objectives, resource outputs, activities, costs, and benefits.

Two alternatives were eliminated from detailed study. These include a mineral leasing alternative and a departure from base sale schedule alternative.

The Plan may be revised when conditions or demand in the planning area change significantly or when change in RPA policy, goals or objectives would have a significant effect on the Forest program. Revisions will not go into effect until considered and approved in accordance with the requirements for the development and approval of a Forest Plan. (36 CFR 219.10(q))

A description of the alternatives considered in detail, including the Proposed Action, follows:

ALTERNATIVE 1 - (PROPOSED ACTION)

The Proposed Action emphasizes intensive management for market output opportunities. Market outputs provide the opportunity to maintain or enhance the stability of industries needed to produce local and regional goods and services. Range, timber, and water exceed their current output levels. Three hundred fifty million board feet of timber will be offered for sale during the period 1984 through 1993. To respond to local interest in accelerating the timber harvest schedule, 35 MMBF will be offered in 1984, and 55 MMBF will be offered annually in 1985 through 1987. A review of the local demand situation will be made prior to the end of 1987 to determine if local demand for timber has significantly changed. If local demand for timber changes significantly, the Plan will be reanalyzed as required by NFMA Regulation 36 CFR 219.10(c). If local demand has not significantly changed, the remainder of the 350 MMBF planned for the decade will be offered in 1988 through 1993 at a rate of 25 MMBF annually. Any of the volume offered but not sold in the first 4 years will still be available for re-offer.

The alternative will meet 79% of total developed recreation demand at the end of the 50-year planning horizon. This allows the private sector to meet part of the demand for developed recreation. In this alternative 13,599 acres of Cannibal Plateau Further Planning Area and no acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Demand for dispersed recreation opportunities outside wilderness will be met. Trail management and reconstruction is emphasized. Trails, trail-heads, and other improvements are constructed or reconstructed to help disperse recreationists. Vegetation treatment is scheduled for approximately 16,100 acres per year during the first ten years.

ALTERNATIVE 2 - (CURRENT PROGRAM - NO ACTION)

Alternative 2 projects current management modified by the minimum NFMA requirements and regional policy. This is the "no action" alternative required by the NEPA regulations. It responds to present program levels and provides a basis for comparison of other alternatives. The increased demand above existing capacity for developed recreation opportunities is not met. Current direction schedules dispersed recreation opportunities and wildlife habitat improvement. No acres of Cannibal Plateau Further Planning Area or Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Livestock grazing increases. Wood fiber production and vegetation treatment are used to achieve other resource goals. Programmed timber sales offered equal 28 million board feet per year in the first ten years. Vegetation treatment would occur on approximately 14,200 acres per year during the alternative's first ten years. The current approved timber management plan on standard and special land is 35 million board feet per year.

### ALTERNATIVE 3 - (1980 RPA PROGRAM)

The RPA alternative (Alternative 3) emphasizes intensive management for market output opportunities. The Forest will provide outputs to meet its share of local, regional, and national demand for goods and services. The outputs are reflected in the 1980 RPA goals and objectives assigned to the Forest. The alternative will meet the increased demand for developed recreation over the planning horizon. Demand for dispersed recreation outside wilderness is met. No acres of Cannibal Plateau Further Planning Area or Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Range, timber, and water exceed their current output levels. Vegetation treatment would occur on approximately 16,500 acres per year during the alternative's first ten years.

### ALTERNATIVE 4 - (NON-MARKET OPPORTUNITIES)

Alternative 4 emphasizes non-market output opportunities. Market output levels are designed to complement non-market opportunities. The increased demand for developed recreation is met over the 50-year planning horizon. The demand for dispersed recreation opportunities outside wilderness areas is met. Economics played an important role in selecting the management prescription mix for each alternative. This was accomplished initially through the FORPLAN model. It was run with the objective function of maximizing present net value. If prescriptions were able to satisfy the constraints, FORPLAN would select the most cost-efficient prescription.

Trail management is emphasized. Trails, trailheads, and other improvements are constructed or reconstructed to help disperse recreationists. In this alternative 31,990 acres of Cannibal Plateau Further Planning Area and 47,400 acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. The alternative schedules wildlife habitat improvement. Permitted livestock grazing and timber harvest outputs are decreased from current levels. Vegetation treatment would occur on approximately 12,800 acres per year during the alternative's first ten years.

### ALTERNATIVE 5 - (MARKET OPPORTUNITIES)

Alternative 5 emphasizes intensive management for market output opportunities. Market outputs provide the opportunity to maintain or enhance the stability of industries needed to produce local and regional goods and services. Range, timber, and water exceed their current output levels. The increased demand above existing capacity for developed recreation is not met. This allows the private sector to meet part of the demand for developed recreation opportunities. The alternative schedules dispersed recreation opportunities and wildlife habitat improvement. No acres of Cannibal Plateau Further Planning Area or Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Permitted livestock grazing increases by 9%. Programmed timber sales offered increase to 35 million board feet in the first ten years. Vegetation treatment would occur on approximately 16,100 acres per year during the alternative's first ten years.

## ALTERNATIVE 6

Alternative 6 emphasizes non-market outputs. Market output levels are designed to complement non-market opportunities. This alternative will meet 79% of the total developed recreation demand at the end of the 50-year planning horizon. This allows the private sector to meet part of the demand for developed recreation opportunities. The demand for dispersed recreation opportunities outside wilderness is met. Trail management will be emphasized. Trails, trailheads, and other improvements are constructed or reconstructed to help disperse recreationists. In this alternative 13,599 acres of Cannibal Plateau Further Planning Area and 34,300 acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. It schedules wildlife habitat improvement. Permitted livestock grazing and timber harvest outputs are decreased from current levels. Vegetation treatment would occur on approximately 12,700 acres per year during the alternative's first ten years.

## ALTERNATIVE 7

Alternative 7 emphasizes intensive management for market outputs. Market outputs provide the opportunity to maintain the stability of industries needed to produce local and regional goods and services. Range, timber, and water exceed their current output levels. The increased demand above existing capacity for developed recreation opportunities is not met. The alternative schedules dispersed recreation opportunities and wildlife habitat improvement. In this alternative 31,990 acres of Cannibal Plateau Further Planning Area and 47,400 acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Permitted livestock grazing increases by 9%. Programmed timber sales offered equals 30 million board feet in the first ten years. Vegetation treatment would occur on approximately 15,700 acres per year during the alternative's first ten years.

## ALTERNATIVE 8

Alternative 8 is designed to augment water yield. This alternative emphasizes intensive management for market outputs. It emphasizes water production through vegetation treatment. Timber resources are managed intensively and silvicultural treatments are designed to enhance water runoff. Permitted livestock grazing will increase by 5%. This alternative will meet 79% of the total developed recreation demand at the end of the 50-year planning horizon. This allows the private sector to meet part of the demand for developed recreation opportunities. The alternative schedules dispersed recreation opportunities and wildlife habitat improvement. Trail management will not be emphasized. In this alternative 13,599 acres of Cannibal Plateau Further Planning Area and no acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Vegetation treatment would occur on approximately 17,100 acres per year during the alternative's first ten years.

## ALTERNATIVE 9 - (REDUCED BUDGET)

Alternative 9 emphasizes market outputs under a 25% reduced budget when compared to fiscal year 1982. The alternative displays outputs, benefits, and costs associated with a reduced budget. Developed recreation capacity is reduced below 1981 levels. Increased demand for developed recreation is not met. This allows the private sector to meet part of the demand for developed recreation opportunities. The alternative maintains dispersed recreation opportunities. No acres of Cannibal Plateau Further Planning Area or Fossil Ridge Wilderness Study Area are recommended suitable for inclusion in the National Wilderness Preservation System. Permitted livestock grazing and timber harvest outputs are decreased from current levels. Vegetation treatment would occur on approximately 9,600 acres per year during the alternative's first ten years.

## COMPARISON OF ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

Table 3 compares the planning question resolution for the nine alternatives considered in detail.

Figures 2 through 10 display selected outputs by alternative. The outputs are average annual for years 1991-2000. All alternatives are compared to current output levels (C) of no-action alternative 2 and Benchmark 3 (BM 3). Benchmark 3 is used because it maximizes the present net value for all outputs having a value assigned in the 1980 RPA program.

TABLE 3.

COMPARISON, PLANNING QUESTION RESOLUTION BY ALTERNATIVE  
(Average Annual Output For Year 1991-2000)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives										
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9		
1	HOW MUCH AND WHAT TYPE OF RECREATION OPPORTUNITIES SHOULD THE FOREST PROVIDE?	A. Developed Recreation Site Capacity.	MRVD											
		(By Decade)												
		1980 - 1990		744	744	744	744	744	744	744	744	744	657	
		1991 - 2000		778	744	812	812	744	778	744	778	744	657	
		2001 - 2010		866	744	968	968	744	866	744	866	744	657	
		2011 - 2020		924	744	1,124	1,124	744	924	744	924	744	657	
		2021 - 2030		1,012	744	1,280	1,280	744	1,012	744	1,012	744	657	
2	HOW MUCH ROADLESS NON-WILDERNESS RECREATION OPPOR- TUNITY SHOULD THE FOREST PROVIDE AND WHERE SHOULD IT BE LOCATED?	B. Developed Recreation Management Level (Full Service-Reduced Service).	Percent FSM/RSM	45/55	45/55	45/55	58/42	31/69	42/58	31/69	58/42	0/100		
		C. Downhill skiing capacity.	PAOT	35,200	35,200	35,200	35,200	35,200	35,200	35,200	35,200	35,200	35,200	
		A. Area allocated to semi-primitive non-motorized recreation outside wilderness.	Percent Acres	16.6 482,400	14.5 420,500	15.9 463,250	13.9 404,200	14.8 431,400	14.1 408,400	14.1 408,950	14.2 412,350	16.4 477,900		
3	WHAT TYPE OF WIL- DERNESS MANAGEMENT IS NEEDED TO MAIN- TAIN THE QUALITY OF THE RECREATION EXPERIENCE IN EX- ISTING AND PRO- POSED WILDERNESS AREAS?	B. Demand for semi-primitive non-motorized recreation.		Demand for semi-primitive non-motorized recreation will be met in all alternatives. Non-wilderness acres currently suitable for dispersed non-motorized recreation will in the future be roaded under some prescriptions. All single purpose, newly constructed roads will be closed. 'Transportation System Management', Plan, Chapter III, provides direction to assure semi-primitive non-motorized recreation opportunities in all alternatives. The Continental Divide National Scenic Trail Corridor will be managed primarily for recreation use. See alternative maps for location.										
		C. Wild and Scenic Rivers.		The Taylor River and the East River were determined <u>not</u> to be eligible for a subsequent formal Wild and Scenic River Study. See Planning Question 12 for trail construction and reconstruction plans by alternative.										
		A. Management Area Prescription** (Wilderness)	Acres											
3		High Density (8D)		0	12,090	12,090	19,275	12,090	38,838	26,460	12,090	12,090		
		Semi-Primitive (8C)		176,278	165,700	165,700	87,286	165,700	106,086	116,013	170,296	165,700		
		Primitive (8B)		185,464	172,076	172,076	220,065	172,076	256,459	200,907	179,356	172,076		
		Pristine (8A)		105,475	103,752	103,752	206,382	103,752	100,134	189,628	105,475	103,752		
		B. Wilderness Management Level (Full Service/Reduced Service)	Percent FSM/RSM	60/40	20/80	20/80	60/40	20/80	60/40	60/40	60/40	40/60	0/100	

TABLE 3. (Cont.)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives								
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
4	SHOULD CANNIBAL PLATEAU FURTHER PLANNING AREA AND FOSSIL RIDGE WILDERNESS STUDY AREA BE RECOMMENDED FOR WILDERNESS DESIGNATION?	A. Portion of Cannibal Plateau suitable for Wilderness.	Acres	13,599	0	0	31,990	0	13,599	31,990	13,599	0
			Percent	43	0	0	100	0	43	100	43	0
		B. Portion of Fossil Ridge suitable for Wilderness.	Acres	0	0	0	47,400	0	34,300	47,400	0	0
			Percent	0	0	0	100	0	72	100	0	0
		C. Total Wilderness Acreage.**	Acres	515,376	501,777	501,777	581,167	501,777	549,676	581,167	515,376	501,777
		D. Oh-Be-Joyful.		A Draft Environmental Impact Statement for Oh-Be-Joyful Wilderness Study Area was transmitted to the Environmental Protection Agency on June 4, 1981. The Forest Service's preferred alternative is that the area is unsuitable for inclusion in the National Wilderness Preservation System. The administration is currently completing the Final EIS.								
5	HOW MUCH HABITAT (FORAGE/COVER/WATER) SHOULD BE AVAILABLE FOR WILDLIFE AND FISH?	A. Area protected for Threatened and Endangered species.	Acres	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104
		B. Total Area of Wildlife Emphasis.	Acres	590,386	620,600	591,544	694,443	532,506	703,176	538,624	657,728	510,383
				Forest Direction, Plan, Chapter III, provides direction for managing the habitat needs of indicator species in all alternatives. Management area prescription 9A has been added in all alternatives. The prescription emphasizes riparian area management. Resource use will be managed to protect and maintain the riparian area in all alternatives.								
6	WHERE AND HOW MUCH FORAGE SHOULD BE ALLOCATED TO BIG GAME USE?	A. National Forest System winter range carrying capacity.	Animals	87,600	87,800	88,500	86,400	88,100	86,700	86,600	87,700	86,200
		B. Wildlife Habitat Improvement.										
		--Structural	Number	10	35	35	10	30	10	47	10	0
		--Non-Structural	Acres	7,998	7,800	7,998	9,800	6,398	9,800	7,830	7,560	4,130
		C. Winter Range Management Area Prescription**										
		--Non-Forest (5A)	Acres	206,305	210,496	207,616	220,097	220,428	220,097	202,023	214,023	229,731
		--Forest (5B)		36,389	32,198	35,078	22,597	22,266	22,597	40,671	28,671	12,963
				The total big game winter range acreage (242,694) is the same for all alternatives. Alternative maps attached to the Final EIS display big game winter range.								
7	WHERE AND HOW MUCH FORAGE SHOULD BE ALLOCATED TO LIVESTOCK USE?	A. Livestock carrying capacity.	AUM	335,800	333,300	339,900	309,900	349,800	309,900	349,900	336,700	315,000
				Grazing capacity is increased by increasing investments in structural and non-structural range improvements (Alternatives 1,2,3,5,7,8). Approximately 95% of the suitable rangelands are in satisfactory condition. Intensive management implemented through individual Allotment Management Plans could bring all rangelands to a satisfactory condition by 1990 in all alternatives.								

TABLE 3. (Cont.)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives								
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
8	HOW SHOULD FOREST PRODUCTS BE MANAGED TO SUPPLY COMMERCIAL AND NON-COMMERCIAL DEMANDS ON THE FOREST?	A Forested area <u>not capable of commercial timber production.</u>	Acres	848,337	848,337	848,337	848,337	848,337	848,337	848,337	848,337	848,337
		B. Capable area <u>not available</u> for commercial timber production	Acres	244,683	245,856	222,952	267,318	222,952	251,196	267,318	229,041	222,952
		C Available area <u>not suited</u> for commercial timber production.	Acres	652,809	682,339	643,581	795,113	671,761	819,389	671,214	694,426	939,625
		D. Available area <u>suited</u> for commercial timber production.	Acres	476,251	445,548	507,210	311,312	479,030	303,158	435,211	450,276	331,227
		E Forested area treated to improve wildlife habitat	Acres	57,528	59,694	63,240	90,556	49,479	90,538	89,592	80,024	44,305
		F. Programmed Sales Offered.	MMBF	35.0	28.0	44.2	13.5	35.0	13.5	30.0	45.0	22.0
		G. Acres Treated by Harvest Method.	Acres									
		--Clearcut		747	270	1,388	209	748	207	523	574	389
		--Shelterwood		5,281	3,767	6,091	2,444	5,280	2,443	5,050	5,663	3,519
		H. Long-Term Sustained Yield Capacity	MMBF	104.9	104.1	115.6	55.9	117.0	57.1	96.9	109.5	62.6
				The current, approved timber management plan on standard and special timberland is 35.0 MMBF.								
9	WHAT SURFACE RESOURCE USES SHOULD BE PERMITTED IN MUNICIPAL WATERSHEDS?	All alternatives manage surface resources to prevent degrading water quality below Federal, State, and local water standards. Management area prescription 10E has been added in all alternatives to protect or improve the quality and quantity of municipal water supplies. The prescription is applied to the Fruita Division (7,440 acres) in all alternatives.										
10	HOW SHOULD THE FOREST RESPOND TO INCREASING DEMANDS FOR WATER?	A Increased water yield (1st decade).	Percent	0.4	0.3	0.4	0.2	0.4	0.2	0.3	0.5	0.2
		B. Increased water yield (5th decade)	Percent	0.7	0.5	0.7	0.5	0.7	0.5	0.6	0.9	0.4
		C. Estimate cumulative water yield increase (50 yr. period).	Ac Ft	823,835	585,600	887,300	608,500	800,300	596,300	713,400	1,062,800	497,260
		D. Portion water yield increase potential** achieved (50 years)	Percent	29.0	21.1	28.7	20.9	28.1	20.5	25.0	37.2	18.8
		E Estimate cumulative sediment yield increase from activities to increase water yield (50 yr period).	Ac Ft	75	54	80	56	73	54	66	98	46
				Water yield increases will be the vegetation treatment goal undertaken for timber, range, and wildlife management purposes in watersheds identified to have the potential for producing more water without detrimental effects on stream channel stability and water quality. Management area prescription 9B emphasizes increased water yield on 14,580 acres in all alternatives.								

TABLE 3. (Cont.)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives										
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9		
11	HOW SHOULD THE FOREST COORDINATE MINERAL ACTIVITIES WITH OTHER RESOURCE VALUES**?	A Area recommended available for leasing with surface occupancy.												
		-within wilderness.	Acres	76,418	0	70,768	129,633	70,768	105,230	129,633	76,418	70,768		
		-outside wilderness.		2,041,637	2,011,370	2,066,692	1,998,995	2,053,245	2,032,839	1,989,722	2,053,385	2,068,417		
		B. Area recommended available for leasing with no surface occupancy.												
		-within wilderness.	Acres	104,807	0	99,337	116,100	99,337	110,295	116,100	104,807	99,337		
		-outside wilderness.		210,679	188,819	200,202	194,498	212,052	192,440	209,139	208,209	208,730		
		C Area recommended unavailable for leasing.												
		-within wilderness.	Acres	285,992	453,618	283,513	287,275	283,513	285,992	287,275	285,992	283,513		
		-outside wilderness.		185,494	251,220	184,515	178,526	186,112	178,231	173,158	176,216	174,262		
		D. Minerals Role.												
				Public domain land is available for mineral exploration and development under all applicable laws and regulation in all alternatives. For leasable minerals the BLM leases tracts for development by the mining industry. Saleable minerals are the only type of mineral commodity for which the Forest can directly affect the supply by selling materials to individuals and private industry. Management requirements for minerals in the Plan are based on statutory and regulatory direction for locatable, leaseable, and salable minerals. The management requirements provide surface resource protection and restoration requirements in all alternatives.										
12	WHAT TYPE OF TRANSPORTATION SYSTEM IS NECESSARY TO MANAGE THE FOREST AND ITS RESOURCES?	A. Increase in Forest road mileage. (1st ten years)	Percent	7	6	7	2	8	2	6	6	5		
		B. Construction/Reconstruction. (1st ten years)												
		Arterials	Miles	57	49	57	11	58	11	47	43	36		
		Collectors		45	38	44	9	45	9	36	34	28		
		Locals		216	185	216	43	219	43	176	164	137		
		Bridges	No.	15	9	15	5	15	5	12	14	9		
		C. Increase in Forest road mileage. (50 year period)	Percent	16	16	23	3	17	3	14	12	10		
		D. Trail construction/reconstruction (1st ten years)	Miles	500	150	110	1,000	150	500	150	150	0		
		E. Trail construction/reconstruction. (50 year period)	Miles	2,450	750	2,120	2,450	750	2,450	750	750	0		
						Forest Direction, Plan, provides travel management direction in all alternatives.								

TABLE 3. (Cont.)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives								
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
13	HOW SHOULD THE FOREST HANDLE PROBLEMS CAUSED BY PRIVATE LAND WITHIN AND ADJACENT TO THE NATIONAL FOREST?	A. Land Exchange.	Acres	Priority for private land exchange is determined by management area prescription of the adjacent land in the alternative selected. The acres exchanged is more dependent on the Forest's funding to process exchanges than on the alternative selected.								
		B. Right-of-Way Acquisition.	Cases	8	8	8	7	8	7	7	8	7
		C. Occupancy Trespass.	Cases	23	23	23	23	23	23	23	23	23
		D. Landline Location.	Miles	20	20	25	15	20	20	20	20	15
		E. Right-of-Way Grants.	Cases	30	30	30	30	30	30	30	30	30
14	WHERE SHOULD THE FOREST PROVIDE UTILITY CORRIDORS AND HOW SHOULD THEY BE MANAGED?			The designation of new utility corridors will be studied on a case-by-case basis regardless of the alternative, but will be consistent with the plans and programs of other agencies. The Rocky Mountain Regional Guide establishes standards and guidelines to be used by the Forest in activities related to utility corridors. Expanding compatible uses in existing corridors is emphasized over new corridor development. The permitting and NEPA processes to be followed when authorizing use and occupancy are located in Forest Service Manuals. Management area prescription ID provides for utility corridors in all alternatives. Management activities within these linear corridors strive to be compatible with the goals of the management area through which the corridors pass.								
15	CAN SERVICE TO THE PUBLIC AND ADMINISTRATION BE IMPROVED WITH FOREST OR DISTRICT BOUNDARY CHANGES?	A. Land Exchange Opportunities	Acres	Land exchange opportunities exist between the Forest Service and BLM, and between the Forest Service and National Park Service. A discussion of the exchange program can be found in the appendices of the accompanying Plan. The Forest has tentatively identified 354,800 acres for possible jurisdictional land transfer between the Forest and the BLM. The Forest has tentatively identified 760 acres for possible transfer to the National Park Service. There are no district boundary changes proposed in any alternative.								

BT

TABLE 3. (Cont.)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives								
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
16	HOW SHOULD THE FOREST MANAGE SIGNIFICANT CULTURAL RESOURCES? (And other Special Interest Areas)			<p>The Tabeguache Ponderosa Pine Area is recommended as proposed Research Natural Area in Alternatives 1, 2, 4, 6, 7, 8, and 9. Each alternative will protect all significant cultural resources by avoidance and or study. Areas containing potential cultural resources will be surveyed prior to ground disturbing activities. The Gothic Research Natural Area will retain its designation in all alternatives. The Dry Mesa Dinosaur Quarry and the Slungullion Earthflow National Natural Landmark will continue to be managed as special interest sites. All alternatives propose management of the following as special management areas:</p> <p>The Alpine Tunnel Historic District.                      The Ophir Needles National Natural Landmark.                      Escalante Creek Research Natural Area.                      Mount Emmons Iron Bog.</p> <p>Management area prescriptions 10A and 10C provide for research natural areas and special interest areas in all alternatives. Slungullion Earthflow National Natural Landmark retains its landmark designation in alternatives 4 and 7 and is also identified suitable for wilderness as part of Cannibal Plateau Further Planning Area.</p>								
17	HOW SHOULD THE FOREST MANAGE THE VISUAL RESOURCE?			<p>Forest Direction, Plan, applies the Visual Management System to all National Forest System land in all alternatives. Visual Resource Management plans, designs, and locates vegetation treatment in a scale which retains the color and texture of the characteristic landscape. In addition, each management area prescription for the alternatives identifies a series of Visual Quality Objectives.</p>								

\* % = Percent  
 FSM/RSM = Full Service Management/Reduced Service Management  
 AUM = Animal Unit Months  
 No. = Number  
 Ac Ft = Acre Feet  
 MMBF = Million Board Feet  
 RVD/Yr = Recreation Visitor Days per Year  
 POAT = Persons At One Time  
 No. An. = Number of Animals

\*\* PQ 3 &  
 PQ 11 - Reflects 88,901 acres of wilderness being displayed by San Juan and White River National Forests and 40,742 acres of wilderness outside the Forest being displayed by Grand Mesa, Uncompahgre, and Gunnison National Forests.  
 PQ 4 - This total includes acres only on Grand Mesa, Uncompahgre, and Gunnison National Forests for the Big Blue, Collegiate Peaks, La Garita, Lizard Head, Maroon Bells-Snowmass, Mount Sneffels, Raggeds, and West Elk Wildernesses. Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area are included only when suitable for wilderness in that alternative.  
 PQ 10 - Water yield increase potential based on tentatively suitable timberland on slopes less than 40 percent.

FIGURE 2.

SEMI-PRIMITIVE NON-MOTORIZED RECREATION  
(Thousand Acres Outside Wilderness)

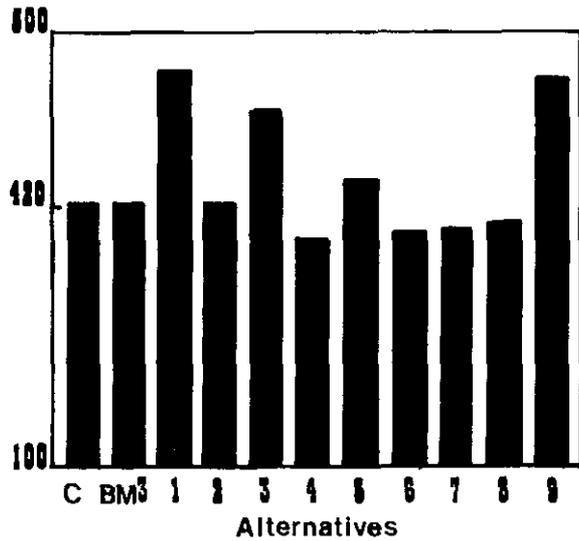


FIGURE 3.

WILDERNESS MANAGEMENT  
(Thousand Acres)

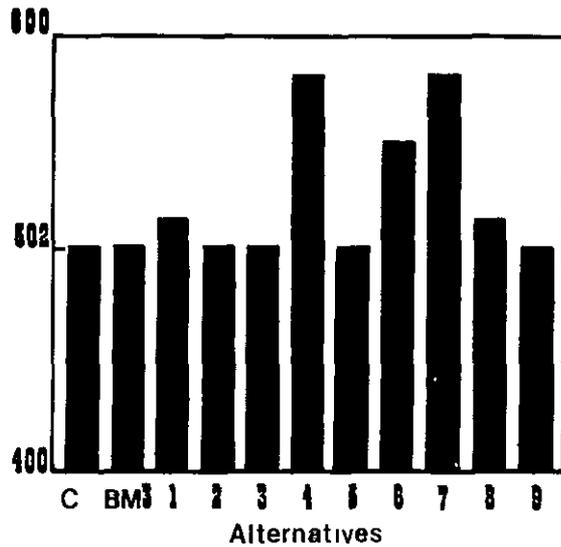


FIGURE 4.

NATIONAL FOREST SYSTEM WINTER RANGE CARRYING CAPACITY  
(Thousand Animals)

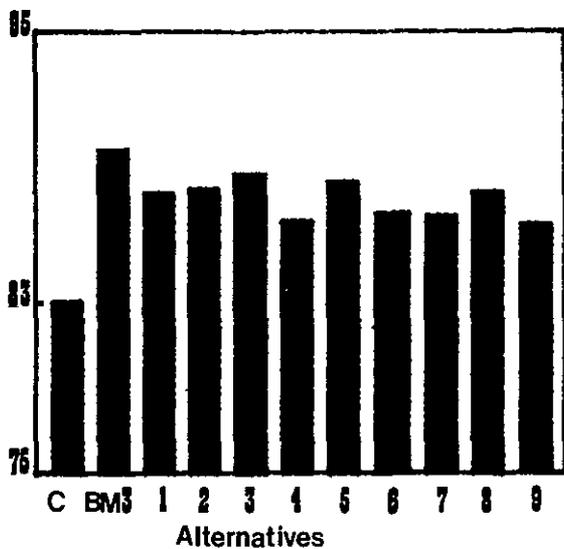


FIGURE 5.

LIVESTOCK GRAZING  
(Thousand Animal Unit Months)

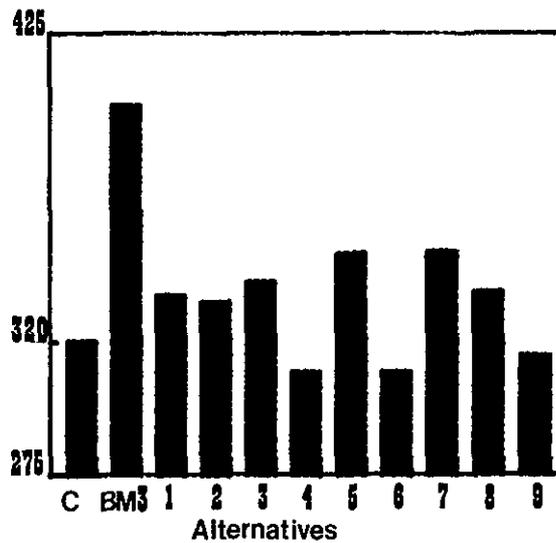


FIGURE 6.

PROGRAMMED TIMBER SALES OFFERED  
(Million Board Feet)

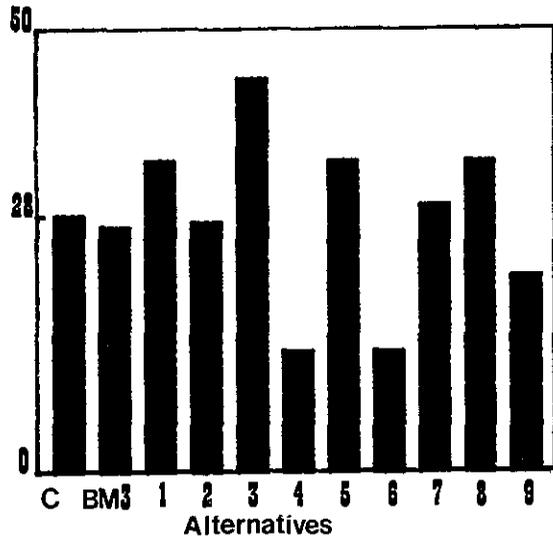


FIGURE 7.

TIMBER LONG-TERM SUSTAINED  
YIELD  
(Million Board Feet)

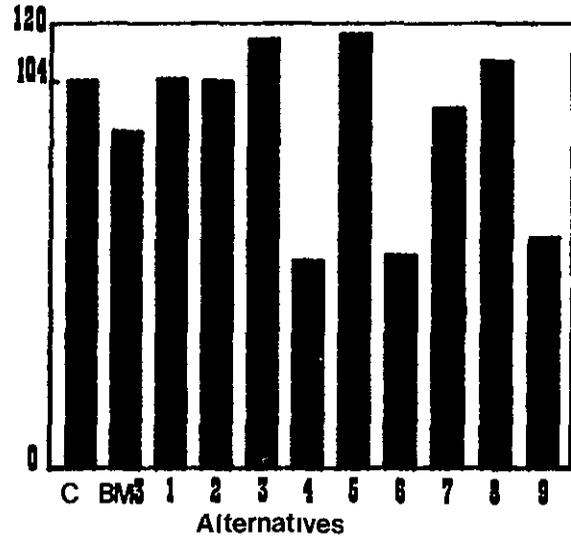


FIGURE 8.

WATER YIELD  
(Million Acre Feet)

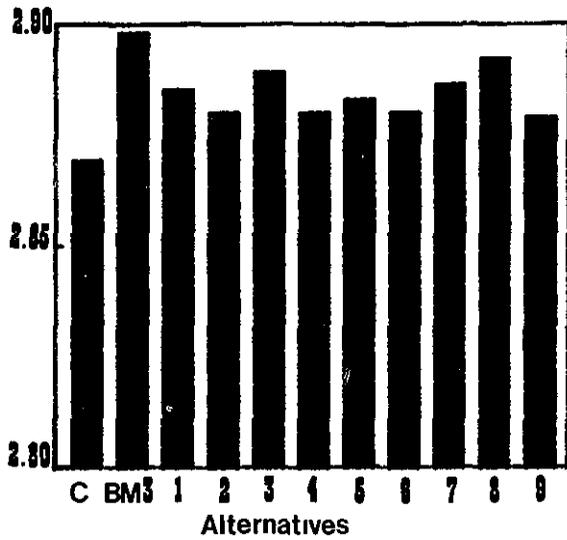


FIGURE 9.

INCREMENTAL PRESENT NET VALUE  
(Million Dollars)

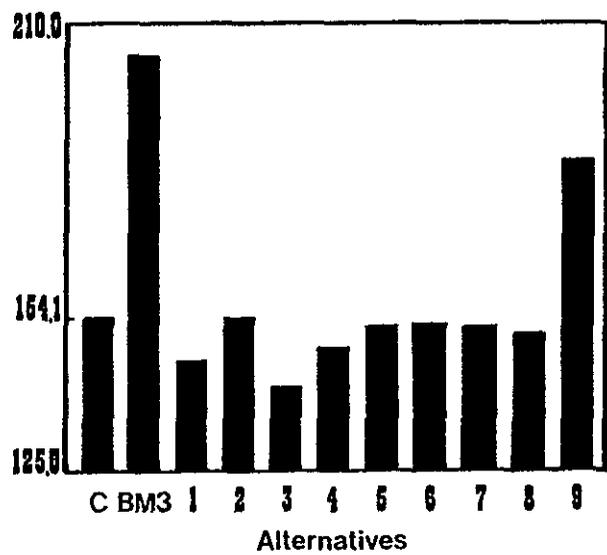
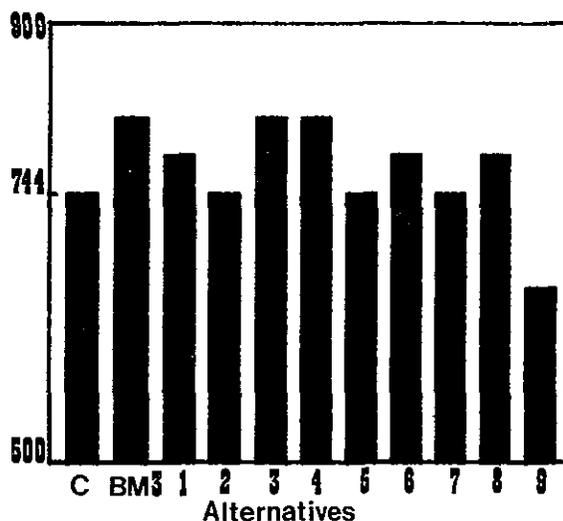


FIGURE 10.

DEVELOPED RECREATION CAPACITY  
(Thousand Recreation Visitor Days)



AFFECTED ENVIRONMENT

This Final EIS chapter describes the physical, biological, social, and economic environment affected by the alternatives. The reader is encouraged to review the affected environment in detail in Chapter III of the Final EIS.

PHYSICAL, BIOLOGICAL, SOCIAL, AND ECONOMIC SETTING

The Forest planning area is located astride two physiographic provinces; Colorado Plateau and Southern Rocky Mountains. The two provinces differ greatly in landforms, rock types, and mineral deposits. Half of the planning area, within the Colorado Plateau Province, is characterized by high flat top mesas and rolling plateaus, sedimentary rocks, and mineral deposits including oil, natural gas, oil shale, coal, vanadium, and uranium. The other half of the planning area is characterized by rugged mountains, igneous rocks, and hardrock minerals including gold, silver, lead, zinc, copper, molybdenum, and uranium. Elevations range from about 6,000 feet to peaks over 14,000 feet.

The Forest is located within the Rocky Mountain Forest Eco-Region of the Highland Province, and includes four major climatic and vegetation zones; lower montane forest, upper montane forest, subalpine forest, and the alpine tundra. Common vegetation types at the lower elevation include sagebrush, pinyon pine, juniper, Gambel oak, and ponderosa pine. Higher elevation includes Engelmann spruce, subalpine fir, lodgepole pine, Douglas-fir, and quaking aspen. The major range types include the mountain meadow, mountain bunch grass, alpine meadow, alpine tundra, and aspen-forb plant associations.

The Forest provides habitat for a variety of game and non-game wildlife species. The more common species include mule deer, elk, black bear, blue grouse, ptarmigan, Gambel's quail, snowshoe hare, and cottontail rabbit. Bighorn sheep inhabit several areas of the Forest. Favorable habitat for the

bald eagle and peregrine falcon exists in the planning area. Fisheries include cutthroat, rainbow, brook, mackinaw, and brown trout; kokanee salmon, northern pike, and white sucker.

Agriculture, mining and logging have been important economic activities in the planning area. Recreation has recently become an important economic factor. National Forest management can affect these resource uses.

#### RESOURCE AND SUPPORT ELEMENTS

National Forest system management is conducted on an integrated basis. Each resource and support element can affect other elements. These interactions are considered in the following discussion.

##### Vegetation

Forest vegetation contributes to Forest character more than most landscape features. Its form, color, and texture, is easily discernible to the human eye. Society perceives it to have beauty and utility. The hundreds of individual plant species which occur on the Forest may be classified into less than a dozen vegetation types. Each type lends a unique character to the landscape and has an associated utility to society. Forest management is linked to vegetation treatment because vegetation influences other resource elements. Vegetation is a dynamic resource. It will change over time. The way it will change is based on factors that effect the vegetaton and the site on which it is growing. The Forest Reserves were established prior to 1900. Since that time Forest managers have largely controlled the factors that effect vegetation and growing conditions. Forest managers control these conditions to provide and maintain a healthy, vigorous environment, capable of producing a range of outputs and conditions. There are consequences associated with not managing the vegetation on the Forest. These consequences are discussed in detail in the Final EIS, Chapter IV under all resources.

##### Recreation

Developed recreation use is currently 578,000 recreation visitor days (RVD's) annually. Capacity at existing sites is 744,000 RVD's. Estimates indicate demand will exceed supply after 1990. The three downhill ski areas on the Forest, Crested Butte, Powderhorn, and Telluride supported 222,000 RVD's during the 1981 season. Potential capacity at these areas is 3.04 million RVD's. This capacity is adequate to meet demand over the 50-year planning horizon. Capacity for dispersed recreation is 10.2 million RVD's annually. Current use is 1.2 million RVD's annually. As demand increases the importance of visual quality will also increase.

##### Wilderness

The Forest administers all or portions of eight wilderness areas totaling 501,777 acres. This is 17% of the Forest acres. Access to the wilderness is generally not restricted, but activites within the wilderness areas are managed to protect wilderness resource values. Wilderness use in 1980 was 164,000 wilderness recreation visitor days.

The Colorado Wilderness Act of 1980 identified Fossil Ridge a Wilderness Study Area (47,400 acres). The Act retained Cannibal Plateau's designation as a Further Planning Area (31,990 acres).

### Fish and Wildlife

The Forest's habitat supports over 314 wildlife and fish species. In 1980, hunting generated 105,200 RVD's and fishing generated 243,200 RVD's. Wildlife and fish use are expected to increase in the future. Habitat management is a joint effort with the Forest and the Colorado Division of Wildlife (DOW).

The Forest contains approximately 242,000 acres of big game winter range. This is only a small portion of the total big game winter range in the area. The majority of the winter range is at lower elevations on BLM and private land. The Forest is coordinating with the State and other Federal agencies to agree upon manageable herd sizes in relation to winter range carrying capacity.

Federal and State threatened and endangered species that may be present on the Forest include: peregrine falcon, bald eagle, whooping crane, greater sand-hill crane, wolverine, lynx, and Colorado River cutthroat. One plant species, the spineless hedgehog cactus is on the Federal list of endangered species and may occur on the Forest. The Uncompahgre Fritillary Butterfly is under consideration for designation and occurs on the Forest.

### Range

The Forest has 1,295,775 acres classified suitable rangeland with 320,000 animal unit months (AUM's) permitted annually. To maintain satisfactory ecological conditions more intensive range management is needed in many allotments. Expected demand for grazing is higher than the Forest is capable of supplying.

### Timber

Approximately 1,089,208 acres have been identified tentatively suitable for timber production. The current annual harvest is 28.8 million board feet (MMBF). The current, approved timber management plan on standard and special land is 35 million board feet per year. Silvicultural activities help achieve other resource objectives. Demand for free-use firewood is estimated at 9 MMBF per year and increasing due to rising fossil fuel costs.

### Water

The water flowing through the Forest comprises an estimated 40% of the Colorado River flow at the Colorado and Utah border. Average annual yield from the Forest is estimated at 2.87 million acre feet. Water yield from tentatively suitable timber land on slopes less than 40% could be increased by 67,000 acre feet above current levels without significant adverse effects on other resources.

## Minerals

Mining plays an important role in the planning area. Locatable minerals that have been developed or could be developed include: gold, silver, zinc, lead, copper, cadmium, uranium, vanadium and molybdenum. Leasable or energy minerals being explored or developed include: oil, gas, coal, and geothermal resources. Mineral exploration and development are expected to increase.

## Human and Community Development

The Forest participates in programs which provide employment, skill training, experience, and education for a wide range of age groups. These programs include Youth Conservation Corp., Senior Community Service Employment, Volunteers, Comprehensive Employment and Training Act, and college work study.

## Protection

Fire statistics indicate the Forest does not have a serious wildfire problem. Annually, an average of 51 fires burn a total of 291 acres. The fire management objective is to provide a cost-effective program which responds to land and resource management goals including fire protection, prevention, suppression, and fuel treatment.

Dwarf mistletoe continues to be a problem in certain areas of lodgepole pine and to a lesser degree in the ponderosa pine. Control efforts are accomplished through vegetation treatment.

The most prevalent insect pests on the Forest are the Engelmann spruce bark beetle, mountain pine beetle, and the Western spruce budworm. There have been serious outbreaks in the past. Currently, mountain pine beetle is causing resource loss on the Uncompahgre Plateau.

Air quality over the Forest is good. The main source of pollutants from Forest activities is suspended particulates from wildfires and prescribed burning.

## Lands

Forest land use and occupancy involves over 850 special use permits that authorize uses such as pasture permits, utilities, ditches and reservoirs, and roads. Highest priority for acquisition has been given to private land located within wilderness. Forest landownership adjustments are coordinated with the plans and programs of other Federal agencies and State and local governments. Opportunities for jurisdictional land transfer have been identified with the BLM and the National Park Service. Non-federal land within and adjacent to the Forest has resulted in management problems that are becoming more critical as demand on public land increases. Access to and within the Forest is a major public issue.

## Soils

The soils management objective is to match activities with soil capability and suitability to insure long-term productivity.

## Facilities

The Forest has 3,874 miles of road. Of this, 1,240 miles are classified arterial or collector roads and 2,634 miles are classified local roads. Eight forest highways, part of the State Highway System, access and cross the Forest. The arterial and collector road system is essentially in place. Many miles need improvement or reconstruction, but the corridors are well established.

Administrative facilities on the Forest include office buildings, work centers, and other service and storage facilities. The Forest owns 98 buildings. The Forest is responsible for 18 dams, 81 bridges, 63 water systems, and 2 waste water and treatment plants. The Forest administers by special use permit 230 dams and 241 ditches and canals.

## ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences of implementing the Proposed Action or any of the alternatives to it. Environmental effects can be either beneficial or adverse, direct or indirect, or cumulative. Forest management requirements in the accompanying Plan mitigate many environmental effects for all alternatives.

This chapter examines short-term use and long-term productivity, irreversible or irretrievable resource commitments, energy requirements, historical and cultural resources, and environmental effects that cannot be avoided. The reader is encouraged to review the environmental consequences in detail in Chapter IV of the Final EIS.

### DIRECT AND INDIRECT ENVIRONMENTAL EFFECTS

Environmental consequences vary for each alternative because different mixes of management activities produce different levels of resource outputs. The reader is encouraged to review the environmental consequences in detail in Chapter IV of the Final EIS.

Table 4 summarizes resource output analysis by alternative over the planning horizon.

Alternatives 2, 5, and 7 will have the same effect on developed recreation. No new sites will be constructed. After 1990, demand for developed recreation will not be met. Alternative 9 shortens use season and reduces capacity 12%. Demand will not be met after 1986. Alternatives 1, 6, and 8 schedule an increase in developed recreation capacity to meet 50% of the increased demand above existing capacity after 1990. Alternatives 1, 6, and 8 schedule sufficient increase in capacity to meet 79% of demand in 2030. Alternatives 3 and 4 schedule developed site construction to meet demand over the planning horizon. Projected demand for downhill skiing will be met by all alternatives. Demand for all dispersed recreation opportunities will be met by all alternatives.

The Forest contains 501,777 wilderness acres including the acres designated by the Colorado Wilderness Act. In Alternatives 2, 3, 5, and 9 no additional acres are suitable for inclusion in the National Wilderness Preservation System. In Alternatives 4 and 7 the entire Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area are suitable for wilderness. In Alternatives 1 and 8; 13,599 acres of Cannibal Plateau and no acres of Fossil Ridge are suitable for wilderness. In Alternative 6; 13,599 acres of Cannibal Plateau and 34,300 acres of Fossil Ridge are suitable for wilderness.

Wildlife habitat improvement will be achieved through silvicultural activities, range revegetation, prescribed burning, and other vegetation treatment activities. These activities are designed to improve habitat for certain management indicator species in all alternatives. Alternative 7 schedules the highest opportunities for significant long-term beneficial effects to management indicator species and meets DOW goals for structural wildlife habitat improvement. Other alternatives fall short of these goals with Alternative 9 the lowest. The lowest opportunity for significant long-term beneficial effects occurs in Alternative 9.

TABLE 4.

RESOURCE OUTPUT ANALYSIS BY ALTERNATIVE  
(Summary All Decades, Average Annual Output)

Output	Unit of Measure**	Current Year	Alternative								
			1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
<b>RECREATION</b>											
Developed Recreation Use (Inc VIS)	MRVD	578	847 2	726 4	968 0	968 0	726 4	847 2	726 4	847 2	653 0
Downhill Skiing Use	MRVD	222	689 1	689 1	689 1	689 1	689 1	689 1	689 1	689 1	689 1
Dispersed Rec Use (Inc Wildlife & Fish)	MRVD	1399	2339 2	2339 2	2339 2	2339 2	2339 2	2339 2	2339 2	2339 2	2339 2
Off-Road Motorized Use	MRVD	168	280 9	280 9	280 9	280 9	280 9	280 9	280 9	280 9	280 9
Trail Construction/ Reconstruction	Miles	0	49 0	15 0	42 4	49 0	15 0	49 0	15 0	15 0	0
<b>WILDERNESS</b>											
Wilderness Management	M Acres	501.8	515 4	501.8	501 8	581 2	501 8	549 7	581.2	515 4	501 8
Wilderness Use	MRVD	164	277 0	277 0	277 0	277 0	277 0	277 0	277 0	277 0	277 0
<b>FISH &amp; WILDLIFE</b>											
Wildlife Habitat Improvement (Aspen and Burning)	Acres	4,000	6,098	5,900	6,098	7,450	4,598	7,450	4,830	5,310	2,730
Threatened and/or Endangered Species Habitat Mgt	Acres	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104
Winter Range Carrying Capacity Deer & Elk	M Animals	82 7	87.1	87 5	88 0	86 2	87 6	86 4	86 2	87 2	85 9
Wildlife Structures	Numbers	35	10	35	35	10	30	10	44 4	10	0
<b>RANGE</b>											
Grazing Use (Livestock)	MAUM	320 0	334 2	332 0	338 1	310 9	346 8	310 9	346 8	335 0	315 0
<b>TIMBER</b>											
Programmed Sales Offered	MBSF	28 8	36 9	31.9	44 8	15 6	36 5	14 8	31 6	35.5	22 3
Reforestation	M Acres	638	375	289	463	218	362	229	326	365	234
Timber Stand Improvement	M Acres	1.5	530	625	530	585	1.0	585	900	1,000	1 528
<b>WATER</b>											
Avg Annual Yield	M Ac ft	2,869 0	2,886 4	2,881 0	2,886 6	2,880.8	2,884 0	2,881.2	2,884 4	2,890.0	2,879 8
<b>MINERALS</b>											
Mineral Leases and Permits	# Op Plans	90	154 4	147 0	154.4	128 0	147 0	128 0	147 0	147 0	50 0
<b>SOILS</b>											
Soil & Water Res Imp (Imp Watershed Condition)	Acres	80	66 0	64 0	66 0	52 0	104 0	52 0	57 0	104.0	0
Annual Soil Survey	Acres	0	61,000	61,000	61,000	61,000	61,000	61,000	61,000	61,000	0
<b>FACILITIES</b>											
Road Const/Reconst	Miles	8 1	2 49	2 38	3.47	52	2 37	52	2 09	1.82	1 57
Arterial Roads	Miles	1 4	1 94	1.85	2 69	40	2 00	40	1 60	1.41	1 22
Collector Roads	Miles										
<b>PROTECTION</b>											
Fuelbreaks & Treatment	M Acres	1 5	1 7	2.9	1 7	2 4	3 4	2 4	2 9	3 4	2
Insect & Disease Survey	M Acres	1 0	4 1	4 1	4 1	7 8	3 3	7 8	4 7	4 1	0
<b>LANDS</b>											
Land Purchase & Acquis	Acres	0	0	0	0	0	0	0	0	0	0
Land Exchange Offer	Acres	440	304 0	304 0	304 0	304 0	304 0	304 0	304 0	304.0	304 0
ROW Acquisition	Cases	11	8 5	8 5	8 5	7 3	8 5	7 3	6 9	8 5	7 3
Occupancy Trespass	Cases	5	14 1	14 1	14 1	21 9	14 1	21 9	14 1	14 1	21 9
Landline Location	Miles	31	20 5	20 0	25 5	15 5	20 5	20 0	20 0	20 5	15 5
<b>HUMAN AND COMMUNITY DEVELOPMENT *</b>											
Human Resources Program	Enrollee Years	19 28	19.28	19 28	19 28	19 28	19 28	19 28	19 28	19 28	19 28
Job Corps	Enrollee Years	0	0	0	0	0	0	0	0	0	0
YCC	Enrollee Years	0	0	0	0	0	0	0	0	0	0

\* Human Resource Programs are not included after 1985

\*\*MRVD = Thousand Recreation Visitor Days  
M Acres = Thousand Acres  
M Animals = Thousand Animals  
MAUM = Thousand Animal Unit Months  
YCC = Youth Conservation Corp

MBSF = Million Board Feet  
M Ac Ft = Thousand Acre Feet  
# Op Plans = Number of Operating Plans  
VIS = Visitor Information Service

All alternatives will increase National Forest System winter range carrying capacity for big game. Riparian habitat will be protected or improved under all alternatives.

Alternatives 3, 5, and 7 will increase permitted livestock grazing 6% to 9% by year 2030. Alternatives 4, 6, and 9 reduce permitted grazing 2% to 3%. Alternatives 1, 2 and 8 schedule slight increases over present levels.

The annual programmed timber sales offered vary with each alternative. Suitable timber land is determined by the alternative direction and timber harvest volume objectives. Alternatives 4 and 6 with the lowest amount of suitable land, schedule the lowest annual harvest, and have the lowest long-term sustained yield capacity. Alternative 3, with the most suitable land, has the greatest annual harvest and long-term sustained yield capacity.

All alternatives increase surface water yield through vegetation treatment. These treatments will be scheduled in watersheds capable of producing more water without detrimental effects on stream channel stability. The magnitude of the increase ranges from 0.4% (Alternative 9) to 0.9% (Alternative 8) over current levels during the fifth decade. Water quality will meet all applicable Federal and State standards.

Demand for mineral exploration and development is expected to increase significantly. Development will require increases in transportation facilities which can cause conflicts with other Forest uses. Operating plans will include provisions to minimize environmental impacts on surface resources.

Human Resource Programs are affected by other agency budget opportunities rather than alternatives. There will be no significant impact of any alternative on Human Resource Programs.

Human-caused wildfire will increase under all alternatives because of the expected population growth and proportionate increase in Forest visitor use. Insect and disease control measures are determined by the infestation level in all alternatives.

All alternatives will maintain air quality above standards. All prescribed burning is conducted in accordance with Colorado Air Quality regulations.

All alternatives will create some effects on the soil resource. Mitigation measures in the accompanying Plan will prevent a permanent loss of soil productivity in all alternatives. The greatest unavoidable soil productivity loss will occur as a result of road construction.

All alternatives propose a net increase in Forest road miles, ranging from 3% to 23% over the 50-year planning horizon. Alternatives 4 and 6 schedule less road construction and greater road closures to motorized vehicle use to enhance semi-primitive non-motorized recreation opportunities and wildlife seclusion. Alternatives 1, 3, 4, and 6 schedule significant increases in trail construction and reconstruction to enhance dispersed recreation opportunities.

## SOCIAL AND ECONOMIC EFFECTS

Some significant social changes will take place in the 10 county planning area regardless of alternative. These changes are related to energy, minerals, and downhill ski area development. These social changes are likely to occur throughout the planning area and will have a greater impact on the social resource values than any alternative impacts. Lifestyle; attitudes, beliefs, and values; social organization; and population and land use will not be significantly affected by National Forest Service management by any alternative. Alternatives may generate some minor opportunities or problems; however, change in outputs when compared to current management is not great enough to cause any significant problems within the planning area.

All alternatives were analyzed for cost-efficiency using Present Net Value (PNV). The PNV is discounted benefits less discounted costs, including only those outputs to which monetary values can be assigned. Figure 9 displays incremental PNV for each alternative. Table 5 displays an incremental comparison of alternatives considered in detail.

Non-monetary values must also be considered. Net public benefit (NPB) is the criterion used to evaluate the overall effect of monetary and non-monetary costs and benefits. Net public benefit is the overall value to the nation of all benefits less all associated costs.

Table 6 summarizes the cost-efficiency analysis at 4% discount rate by alternative. Benchmarks 1 and 3 are presented for comparison. Benchmark 3 is designed to calculate the highest achievable PNV. Benchmark 1 estimates the minimum management level needed to maintain the Forest as part of the National Forest System. The alternative PNV is incremental above Benchmark 1. Incremental PNV is the added cost and benefit associated with management activities under the different alternatives.

Benchmark 3 has the highest PNV. This Benchmark level has relatively high present value benefits (PVB) and relatively low present value costs (PVC). Benchmark 3 is not constrained by Forest Service policy. It does not include costs for activities responding to policy. Some of these activities are visual and cultural resource management, soils and water improvement, various inventory costs and non-declining flow timber production.

Excluding these costs effectively lowers PVC and raises PNV \$28.2 million (4% discount rate). All alternatives considered in detail are constrained by policy.

TABLE 5.

INCREMENTAL ALTERNATIVE COMPARISON  
(Summary All Decades, Million 1978 Dollars, 4% Discount Rate)

	ALTERNATIVES								
	HIGHEST PNV 9	2	7	5	6	8	4	1	LOWEST PNV 3
Present Value Cost	99.4	140.5	145.5	149.4	133.8	153.2	141.8	157.0	172.4
Cost Difference*	+41.1	+5.0	+3.9	-15.6	+19.4	-11.4	+15.2	+15.4	
Present Value Benefit	283.2	294.6	298.1	302.0	286.1	304.2	290.2	302.8	313.3
Benefit Difference*	+11.4	+3.5	+3.9	-15.9	+18.1	-14.0	+12.6	+10.5	
Incremental Present Net Value	183.8	154.1	152.6	152.6	152.3	151.0	148.4	145.8	140.9
Present Net Value* Difference	-29.7	-1.5	-0.0	-0.3	-1.3	-2.6	-2.6	-4.9	

\* Indicates the difference in cost, benefit, and PNV between alternatives.

TABLE 6.

COST EFFICIENCY ANALYSIS SUMMARY  
(Million 1978 Dollars)  
4% Discount Rate

	BMI*	BM3	Alternatives								
			1	2	3	4	5	6	7	8	9
Present Value Benefits, Incremental**	203.1	312.0	302.8	294.6	313.3	290.2	302.0	286.1	298.1	304.2	283.2
Assigned Values Less Receipts	191.0	295.9	286.9	279.0	296.8	275.3	286.1	271.0	282.4	288.2	268.3
Federal Receipts	12.1	16.1	15.9	15.6	16.5	14.9	15.9	15.1	15.7	16.0	14.9
Present Value Costs, Incremental	11.4	108.4	157.0	140.5	172.4	141.8	149.4	133.8	145.5	153.2	99.4
Forest Service, Long Range											
Fixed	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Investment	0.0	6.5	9.4	8.4	10.3	8.5	9.0	8.0	8.7	9.2	6.0
Operational	0.0	75.9	110.0	98.3	120.7	99.2	104.6	93.7	101.9	107.2	69.6
General Administration	0.0	10.8	15.7	14.1	17.3	14.2	14.9	13.4	14.5	15.4	9.9
Non-Forest Service - Cooperator											
Costs	4.1	15.2	21.9	19.7	24.1	19.9	20.9	18.7	20.4	21.4	13.9
Present Net Value, Incremental	191.7	203.6	145.8	154.1	140.9	148.4	152.6	152.3	152.6	151.0	183.8
Benefit Cost Ratio, Incremental	17.8	2.88	1.93	2.10	1.82	2.05	2.02	2.14	2.05	1.99	2.85

\* The figures for BMI, Minimum Level, are not "incremental". Figures for BM3 and the alternatives 1-9 are "incremental" to BMI.

\*\* All demand curves are horizontal. Consumer surplus is zero and not shown.

## ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Mitigation measures are included in the Management Requirements for all alternatives. They will limit the adverse effects that cannot be avoided. However, the alternatives, including the Proposed Action, will have some adverse, unavoidable effects including:

- Intermittent decrease in air quality due to dust from road construction, maintenance, and use; from mineral exploration and development activities; and smoke from campfires, prescribed burning, and wildfires.
- Vegetation eliminated for road and trail construction, structural range and wildlife habitat improvements, developed recreation sites, and administrative sites.
- Conflicts will increase between recreation and other Forest use activities.
- Solitude loss due to increased management and use activities.
- Temporary wildlife disturbance in some locations because of increased management and use activities.
- An increase in energy requirements needed to manage the Forest.

## SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE OF LONG-TERM PRODUCTIVITY

Forest management is a long-term commitment. Forest management requires short-term resource use, conducted in a manner that ensures long-term productivity.

The Proposed Action and alternatives meet the Multiple-Use Sustained-Yield requirement to provide for the "achievement and maintenance in perpetuity of a high level annual or periodic output of the various renewable resources of the national forests without impairment of the productivity of the land." The long-term land productivity is maintained or improved in all alternatives while producing outputs, goods, and services over the planning horizon.

## CONSULTATION WITH OTHERS

This Final EIS is the latest in a series of efforts designed to involve the public in the development of the Forest Plan. Comments on the Draft EIS received during the review period were used in preparation of Final EIS. The public comment period closed February 19, 1983. The reader is encouraged to review changes between the Draft and Final EIS in Chapter I. The reader is also encouraged to review public comments and Forest Service responses in Chapter VI.

The final decision regarding Plan approval will be documented in a Record Of Decision issued at the time the Final EIS and Forest Plan are available to the public. The decision regarding the addition of Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area to the National Wilderness Preservation System is reserved for Congress and will be made at a later date.



# I. Purpose and Need

CHAPTER I  
PURPOSE AND NEED

OVERVIEW

The purpose of a Forest Land and Resource Management Plan (the Plan) is to address local, regional, and national issues related to National Forest management; to define a mix of management activities that will promote the sustained use and protection of forest resources; guides development of multi-year implementation programs for the Supervisor's Office and Ranger Districts; and provides direction to the Supervisor's Office and Ranger Districts for identifying activities and expenditures to achieve on-the-ground results. The Plan is needed to address the conflicting desires between forest user groups. There is a need to resolve these conflicts, and to update and display information in one Plan that integrates management direction for all forest resources. The Plan provides a management program reflecting a mix of management activities to achieve a healthy, vigorous forest environment. The environment must be capable of supporting a wide range of natural processes and human activities. Vegetation treatment is the major tool the Forest utilizes to achieve this overall goal. The Plan will also satisfy guiding legislation.

The Proposed Action is described in the attached: Grand Mesa, Uncompahgre, and Gunnison National Forests' Land and Resource Management Plan. For purposes of disclosure, this Final EIS and Plan are treated as combined documents.

The Plan schedules outputs for the Grand Mesa, Uncompahgre, and Gunnison National Forests (the Forest) and guides all resource management activities. The Plan accomplishes these objectives by the following means:

- Defines management activities appropriate to the range of conditions found on the Forest.
- Allocates land uses to the combination of management activities for which they are most suited; recognizing needs to change management direction, needs and conflicts expressed by the issues and concerns; and recognizing the productive land potential and its sensitivity to the impacts of management activities.
- Specifies the resource production outputs associated with specific land use allocations.
- Establishes standards and guidelines for resource use and protection.
- Establishes monitoring standards to ensure that actual outputs and effects are consistent with those planned.
- Provides a framework for project level decisions and for budget proposals.
- Integrates individual resource planning activities.
- Coordinates Forest Service planning activities with the efforts of State and local governments and Indian tribes.

--Provides input for future Forest and Rangeland Renewable Resource Planning Act (RPA) Programs and the Rocky Mountain Regional Guide.

This Final EIS is not a decision document. It is a document disclosing the environmental consequences of implementing the Proposed Action and alternatives to that action which were considered in developing the Plan for the Forest. The alternatives displayed in this Final EIS are applicable only to National Forest System land.

The Plan guides management of the Forest for the next 50 years. It will be reviewed and updated, if necessary, at least every five years; and completely revised at least every ten to fifteen years. This is a requirement of the National Forest Management Act of 1976 (NFMA). The requirements assure the Plan will be dynamic and will respond to change.

A glossary to aid in reading and interpreting this Final EIS and Plan is included in Appendix A. Maps displaying the Management Area Direction for each alternative considered in detail are attached to this Final EIS.

The Plan is required by RPA, amended by NFMA. The regulations specify that the Plan will be accompanied by an EIS. This Final EIS conforms to the requirements of the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations.

The planning process is outlined in the NFMA regulations. The process uses an interdisciplinary approach to develop the Proposed Action and the alternatives. The Planning Actions described in the regulations, and used in this Forest planning process are:

- Identification of Issues, Concerns, and Opportunities.
- Development of Planning Criteria.
- Inventory Data and Information Collection.
- Analysis of the Management Situation.
- Formulation of Alternatives.
- Estimated Effects of Alternatives.
- Evaluation of Alternatives and Identification of the Preferred Alternative.
- Selection of the Preferred Alternative (or Proposed Action).
- Implementation of the Forest Plan.
- Monitoring and Evaluation of the Forest Plan.

Forest planning documents are available for inspection during regular business hours at the Forest Supervisor's office:

Grand Mesa, Uncompahgre, and  
Gunnison National Forests  
Supervisor's Office  
2250 U.S. Highway 50  
Delta, Colorado 81416

These documents, known as planning records, contain the detailed information used to develop the Plan. The planning records are incorporated by reference and are referenced to appropriate points in the text and appendices of this Final EIS and in the Plan.

Forest planning occurs within the framework of National and Regional planning. The Regional Guide establishes management standards and guidelines, addresses regional issues and concerns, and identifies resource output targets for the Forests within the Region. The question of meeting assigned targets and addressing local issues and concerns is addressed in the Forest planning process.

Each Plan in turn, validates or provides a basis for changing the production levels assigned by the Regional Guide. Activities and projects are planned and implemented by the Forest to carry out the direction developed in the Plan. Information from all of the Forest plans in the Region will be used in revising the Regional Guide. Regional Guide implementation will require a review of Forest Plans to determine if amendments are necessary.

The NFMA regulations require the Forest Service to coordinate its national, regional, and Forest planning with related planning efforts of other Federal agencies, State and local governments, and Indian tribes. These agencies were contacted. All levels of Forest planning were coordinated with the planning efforts of these agencies. This coordination assisted in making the Forest planning effort compatible with the goals, objectives, and priorities of those other agencies.

In comments on the Draft EIS, the town of Pitkin endorsed wilderness designation for Fossil Ridge Wilderness Study Area (WSA). The Colorado Department of Natural Resources, stated in their letter on the Draft EIS that Governor Lamm endorsed Fossil Ridge WSA after careful study in 1979, and the Colorado Division of Wildlife feels wilderness will benefit wildlife on Fossil Ridge.

The Colorado Wilderness Act of 1980 (Public Law 96-560) designated Fossil Ridge (47,400 acres) a Wilderness Study Area. The Forest Service was directed to further assess the area and to make a recommendation on the suitability or unsuitability of the area for inclusion in the National Wilderness Preservation System by 1983. This was done within the context of the Forest planning process. A Wilderness Study Report was prepared.

The Record of Decision which approves the Grand Mesa, Uncompahgre and Gunnison National Forest's Plan will recommend the suitability or unsuitability of Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area for inclusion in the National Wilderness Preservation System.

A legislative EIS for Fossil Ridge will be prepared based on information and analysis disclosed in the Final EIS for the Plan and an analysis of the records of the public hearings. Public hearings were held on January 11, 1983 in Gunnison, Colorado and January 12, 1983 in Denver, Colorado. The Draft EIS for the Plan was issued on October 25, 1982 for public review and comment. The comment period on the Proposed Plan and Draft EIS and the hearing record for the Fossil Ridge Wilderness Study Area closed February 19, 1983. Chapter VI in this Final EIS documents the consultation and public comment on the Draft EIS.

The legislative EIS for Fossil Ridge with the Regional Forester's recommendation will receive further review and possible modification in the offices of the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States. After the President transmits the Administration's final recommendation to Congress, the legislative EIS will be filed with the Environmental Protection Agency and distributed to the public. Final decisions on wilderness designation have been reserved by Congress.

The wilderness characteristics of the Fossil Ridge Wilderness Study Area will be protected until Congress acts.

The Colorado Wilderness Act also designated Oh-Be-Joyful (5,500 acres) a Wilderness Study Area. The Forest Service was directed to further assess the area and to recommend the suitability or unsuitability of the area for wilderness classification. A separate Draft EIS was prepared and hearings have been held. The Administration is currently completing the Final EIS.

The Colorado Wilderness Act retained RARE II's designation for Cannibal Plateau (RARE II Area A-2218). Cannibal Plateau is a further planning area requiring further study before a recommendation can be made regarding suitability or unsuitability for inclusion in the National Wilderness Preservation System. This analysis and evaluation was conducted within the context of the Forest planning process. Hearings will not be held prior to making a final recommendation to Congress because this is within the context of the Colorado Wilderness Act.

If, in the Record of Decision which approves the Forest Plan, a Further Planning Area is recommended suitable for wilderness, a legislative environmental impact statement (EIS) will be prepared. The legislative EIS will be submitted to the Washington Office of the Forest Service. The legislative EIS for Cannibal Plateau with the Regional Forester's recommendation will receive further review and possible modification in the offices of the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States. If the wilderness recommendation is affirmed, the President will transmit the Administration's final recommendation to Congress. The legislative EIS will be filed with the Environmental Protection Agency and distributed to the public. Final decisions on wilderness designation have been reserved by Congress.

If the decision in the Forest Plan Record of Decision is that a Further Planning Area is best suited for nonwilderness purposes, the Chairman of the Senate Energy and Natural Resources Committee and the Chairman of the House Interior and Insular Affairs Committee will be notified by letter. A waiting period of 90 days is necessary while Congress is in session before the portion of the decision which directly affects the Further Planning Area can be implemented. The 90-day waiting period begins on the date of EPA's Notice of Availability published in the Federal Register.

In the 1980 National Materials and Minerals Policy Research and Development Act and the Energy Security Act of 1980, Congress directed the Forest Service to encourage private investors in developing domestic mineral resources and to proceed in making recommendations to the Bureau of Land Management regarding leasing proposals on National Forest System land. Minerals Management direction is displayed in Chapter III, Management Requirements for the Forest Plan.

Two Wild and Scenic River Eligibility Reports were developed as part of the Forest planning process. The reports were prepared for the East River and the Taylor River. The reports are attached as Appendix G to this document.

This planning effort has been coordinated with the environmental analysis for the proposed Mount Emmons mining project. The Notice of Availability for the Mt. Emmons Mining Project Final EIS was published in the Federal Register, October 29, 1982. The proponent has postponed the project indefinitely. Therefore, no decision has been made by the Forest Service regarding approval of the proposal.

A Notice of Intent to prepare an EIS for the Forest Plan was published in the Federal Register on November 14, 1980. The Draft EIS for the Plan was issued on October 25, 1982 in draft form for public review and comment. The comment period on the Proposed Plan and Draft EIS closed February 19, 1983. The Notice of Availability was published in the Federal Register, November 11, 1982. Chapter IV in this Final EIS documents the consultation and public comment on the Draft EIS. After the 90-day comment period closed, the Proposed Plan was amended as necessary to adequately respond to public comment, new or improved data, and additional analysis. The Regional Forester uses the Final EIS in making a decision under NFMA regarding Plan approval. This decision is documented in a Record of Decision, and is attached to this Final EIS.

The "Record of Decision" for the Final EIS includes the management decisions for the White River and Rio Grande National Forest portions of the Raggeds and La Garita Wildernesses.

The planning effort included 12 scoping meetings, September 1981, conducted in local communities and Denver. Open house meetings were conducted in November 1981 at the ranger district offices. These open houses were designed to give the public an opportunity to review preliminary alternatives, including land use allocations, output levels, and management directions.

As soon as practicable after the Plan is approved, the Forest Supervisor will ensure that, subject to valid existing rights, all outstanding and future permits and other occupancy and use documents which affect National Forest System lands are consistent with the Plan. The management direction displayed in the Plan is used in analyzing proposals by prospective Forest users. All permits, contracts, and other instruments for occupancy and use of the National Forest System land covered by this Plan must be consistent with the Management Requirements in both the Forest and Management Area Direction sections. This is required by 16 USC 1604 (i) and 36 CFR 219.10 (e).

Subsequent administrative activities affecting National Forest System land, including budget proposals, shall be based on the Plan. The Forest Supervisor may change proposed implementation schedules to reflect differences between proposed annual budgets and actual funds received. Schedule changes resulting from a reduced budget will be considered an amendment to the Forest Plan. These changes shall not be considered a significant amendment, and will not require an EIS unless the changes significantly alter the long-term relationship between levels of multiple-use goods and services projected under planned budget proposals as compared to those projected under actual appropriations.

Implementation of this management direction is the key to translating the goals, objectives, and management requirements into on-the-ground results. The Plan is implemented through the program development, budgeting, and annual work planning processes. These processes supplement the Plan and make the annual adjustments and changes needed to reflect current priorities within the overall management direction.

The Plan guides development of multi-year implementation programs for each Ranger District. The Plan's management area direction, objectives, and management requirements are translated into these multi-year program budget proposals which specifically identify the activities and expenditures necessary to achieve the direction provided by the Plan. These implementation programs form the basis for the Forest's annual program budget.

Upon approval of the final budget appropriation for the Forest, the annual program of work is finalized and implemented on the ground. The annual work plan provides the detail to the program budget proposals necessary to guide the land managers and their staffs in responding to the direction of the Plan. The activity files in the data base and the Program Accounting and Management Attainment Reporting System provide information for monitoring the accomplishment of the annual Forest program.

Future environmental documents prepared on the Forest will tier (40 CFR 1502.20 and 1508.28) on the Final EIS prepared for the Plan. Environmental analysis for project implementation will use the Plan as direction. Additional details may be included in the environmental analyses for project level decisions. Environmental documents for specific projects implemented under this Plan direction will, therefore, be site specific only.

The management direction displayed in Chapter III, Plan, is composed of two major parts: Forest Direction and Management Area Direction.

Forest Direction consists of goals, objectives, and management requirements for the Forest. The goals and objectives provide broad overall direction regarding the type and amount of goods and services the Forest will provide. The management requirements contained in the Forest Direction set the minimum standards that must be maintained while achieving these goals and objectives. Management requirements establish the broad multiple-use management direction and generally apply to all areas of the Forest.

Management Area Direction consists of individual management area prescriptions applicable to specific management areas. The management area prescriptions contain management requirements specifying which activities will be implemented to achieve goals and objectives. Management requirements are specific to individual management area prescriptions within the Forest and are applied in addition to the Forest Direction Management Requirements. The management area map attached to this document indicates where the individual management area prescriptions will be applied.

#### VICINITY OF THE FOREST

The Forest is located in West-Central Colorado on the west slope of the Colorado Rockies. The Forest includes portions of the following counties: Delta, Garfield, Gunnison, Hinsdale, Mesa, Montrose, Ouray, Saguache, San Juan, and San Miguel. Figure I-1 is a vicinity map displaying land administered by the Forest.

There are 2,953,186 acres of National Forest System land comprising the Grand Mesa (346,141 acres), Uncompahgre (944,241 acres), and Gunnison National Forests (1,662,804 acres). Within the Forest boundary, there are 210,217 acres in private, State, or other Federal ownership. Table I-1 displays National Forest System acres by county.

This Final EIS discloses alternative management direction for 2,905,027 acres of National Forest System land. This acreage includes all of the La Garita and Raggeds Wildernesses. This Final EIS does not disclose alternative management direction for the Lizard Head, Collegiate Peaks, and Maroon Bells-Snowmass Wildernesses. Table I-2 summarizes the area covered by the Plan and Final EIS.

Management direction was established cooperatively between this Forest and the San Juan, White River, and Rio Grande National Forests to ensure uniform management within each wilderness area. Each Forest will continue to administer their respective portions of the wilderness areas.

The Final EIS discloses management alternatives and their potential impacts on the five wilderness areas displayed in Table I-3.

The San Juan National Forest's Final EIS will disclose alternative management direction for the entire Lizard Head Wilderness. This includes 20,342 acres managed by this Forest. The White River National Forest will disclose alternative management direction for the Maroon Bells-Snowmass Wilderness and the Collegiate Peaks Wilderness. This includes 19,598 acres and 48,961 acres respectively, managed by this Forest.

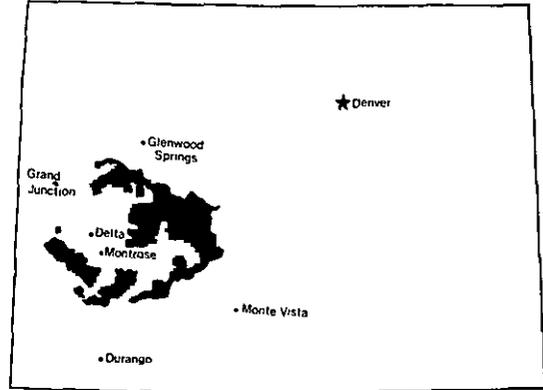
FIGURE I-1.

VICINITY MAP  
 (Grand Mesa, Uncompahgre and Gunnison National Forests)

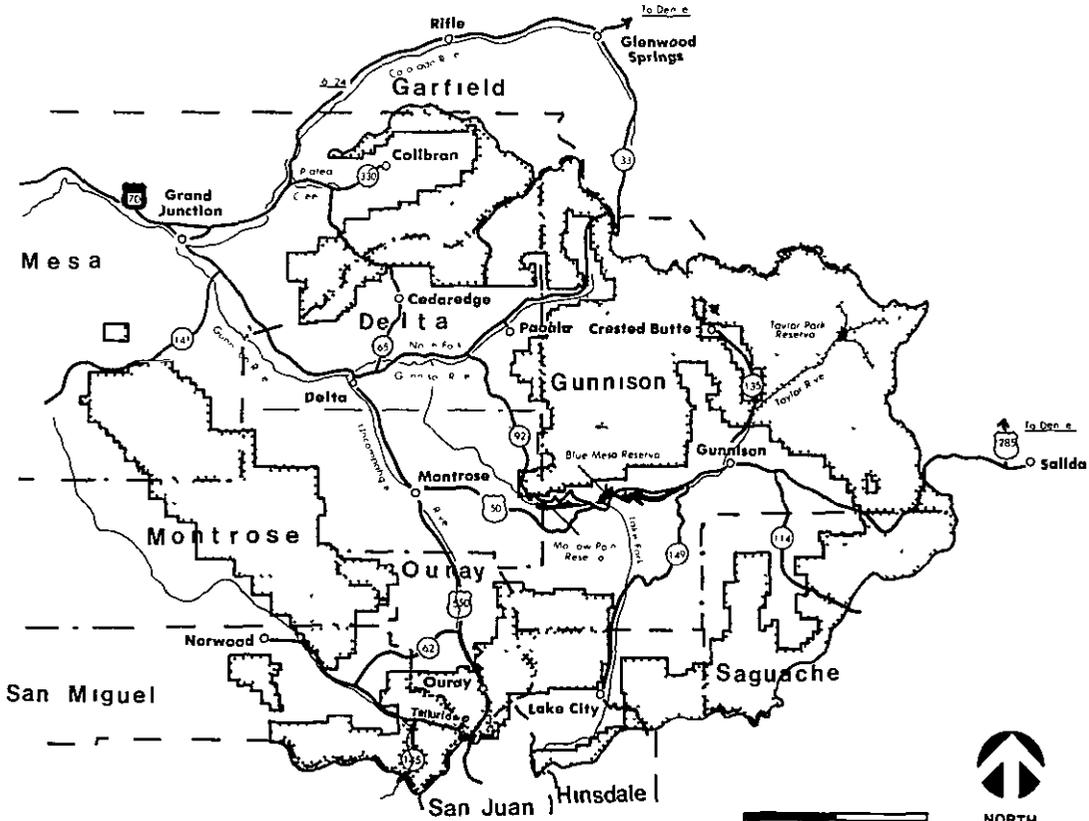
Region 2, Forest Service,  
 United States Department of Agriculture



The State of Colorado



Grand Mesa, Uncompahgre & Gunnison National Forests



National Forest System Land   
 County Line

TABLE I-1.

GRAND MESA, UNCOMPAGRE, AND GUNNISON  
NATIONAL FORESTS ACREAGE SUMMARY  
(Within Forest Boundary)

County	National Forest	Other	Total
Delta	191,649	4,672	196,321
Garfield	2,043	0	2,043
Gunnison	1,204,677	89,774	1,294,451
Hinsdale	176,644	2,178	178,822
Mesa	459,848	13,386	473,234
Montrose	304,785	19,232	324,017
Ouray	127,026	23,269	150,295
Saguache	312,481	9,162	321,643
San Juan	2,007	535	2,542
San Miguel	172,026	48,009	220,035
<u>TOTAL</u>	<u>2,953,186</u>	<u>210,217</u>	<u>3,163,403</u>

TABLE I-2.

ACREAGE SUMMARY

Area	Acres
Total Grand Mesa, Uncompahgre, and Gunnison National Forest System Land	2,953,186
Forest Wilderness Acres Disclosed in Other Forest EIS's	88,901
Net Grand Mesa, Uncompahgre, and Gunnison National Forest System Land Disclosed in This EIS	2,864,285
Other Forest Wilderness Acres Disclosed in This EIS	40,742
Total National Forest System Land Disclosed in This EIS	2,905,027

TABLE I-3.

WILDERNESS AREAS COVERED IN THIS FINAL EIS  
(Acres)

Name	Net N.F. Acres
Big Blue Wilderness	98,235
La Garita Wilderness (includes 24,164 acres administered by the Rio Grande N.F.)	103,986
Mount Sneffels Wilderness	16,200
Raggeds Wilderness (includes 16,578 acres administered by the White River N.F.)	59,105
West Elk Wilderness	176,092
<u>GRAND TOTAL</u>	<u>453,618</u>

SCOPE OF THE ISSUES TO BE ADDRESSED

The Plan addresses public issues and management concerns. These issues and concerns were derived from comments solicited at public meetings, from written responses to the Forest's Scoping Document, from the Forest staff, and from comments received on the Draft EIS. Federal, State, and local governments were contacted, and their issues identified. These issues and concerns are the topics the Plan will address.

The Draft EIS for the Plan was issued on October 25, 1982 for public review and comment. The comment period on the Proposed Plan and Draft EIS closed February 19, 1983. The Final EIS and Plan have been amended to respond to public comment, new or improved data, opposing views, and additional analysis. The reader is encouraged to review Chapter VI of the Final EIS. Chapter VI documents consultation with the public; Federal, State and local governments; industry; organizations; and legislators. The section CHANGES BETWEEN DRAFT AND FINAL EIS in this chapter summarizes changes between the Draft and Final EIS.

The individual public issues and management concerns were combined into general statements. These general statements were grouped into broad categories and were summarized in seventeen Forest planning questions. A detailed discussion of this process is contained in the Forest planning records. How each planning question is addressed by an alternative also determines the manner in which the issues and concerns are addressed. The following identify and briefly describe the Forest planning questions and provide a summary of the issues and concerns.

PLANNING QUESTION 1: How much and what type of recreation opportunities should the Grand Mesa, Uncompahgre, and Gunnison National Forests provide?

This planning question deals with the quantity and location of developed recreation facilities on National Forest System land. There is a need for adequate up-to-date developed recreation facilities for winter and summer use. Existing developed recreation capacity is inadequate to meet increasing demand. An issue related to this planning question is the extent to which the Forest should compete with the private sector in providing developed site recreation opportunities. The Forest has a large resource of dispersed recreation opportunities not available in the private sector. If management was oriented more toward providing dispersed opportunities, part of the developed recreation demand could be met by the private sector.

PLANNING QUESTION 2: How much roadless, non-wilderness recreation opportunity should the Forest provide and where should it be located?

The major parts of this planning question involve conflicts between the motorized and non-motorized recreation uses. Some individuals want additional opportunities for non-motorized recreation activities such as hiking, cross-country skiing, hunting, and fishing. Some individuals consider too much of the Forest roaded.

PLANNING QUESTION 3: What type of wilderness management is needed to maintain the quality of the recreation experience in existing and proposed wilderness areas?

This planning question addresses the type of wilderness management needed to maintain a quality wilderness recreation experience. The issues center around conflicts between wilderness use and range resource management, and between different types of wilderness users.

PLANNING QUESTION 4: Should Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area be recommended for inclusion in the National Wilderness Preservation System?

This question addresses the suitability of Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area for inclusion in the National Wilderness Preservation System. The Colorado Wilderness Act identified Fossil Ridge a Wilderness Study Area and retained Cannibal Plateau's Further Planning Area designation.

PLANNING QUESTION 5: How much habitat (forage, cover, water) should be available for wildlife and fish?

This planning question addresses the wildlife (excluding deer and elk) resource.

Public issues and management concerns are related to questions concerning mineral exploration and development, transportation, and municipal watersheds. The issues indicate a desire to protect and manage wildlife habitat, including threatened and endangered species. Issues were raised on how fishery habitat will be managed.

PLANNING QUESTION 6: Where and how much forage should be allocated to big game use?

This planning question addresses National Forest System winter range carrying capacity for elk and deer. The scope of this planning question revolves around providing the range resource compatible with big game habitat.

Most public issues and management concerns related to conflicts between livestock grazing and big game. Critical big game winter range is being lost outside the Forest boundary caused by subdivision of private land. Big game herd size is increasing and the habitat loss is causing conflicts with grazing on the Forest.

PLANNING QUESTION 7: Where and how much forage should be allocated to livestock use?

This planning question addresses allocation of the range resource between competing uses. Public issues indicated Forest users were concerned with how much grazing will be permitted, and where it will occur in relation to other resource uses. Public issues opposed to domestic livestock grazing centered around riparian zones, wilderness, and municipal watersheds.

PLANNING QUESTION 8: How should Forest products be managed to supply commercial and non-commercial demands on the Forest?

This planning question addresses timber management on the Forest. Public issues include increasing demand for firewood, clear cutting, the effect of timber harvest on watershed conditions and the role of this Forest in supplying timber for the nation.

Correspondence commenting on the Draft EIS and Proposed Plan indicated a group of investors wish to construct a modern sawmill and planer mill in Montrose, Colorado. The investors indicated that the timber demand figures displayed in the Draft EIS are based on past harvest volumes and have no allowance for future industrial development. They requested that the annual sales program be rescheduled to reflect more total management of the timber resource. An annual sale of 55 to 60 mmbf would help justify the large capital expenditures required to establish a modern process facility.

Management concerns include using the timber management program to achieve multiple use objectives.

PLANNING QUESTION 9: What surface resource uses should be permitted in municipal watersheds?

This planning question addresses the potential effects of recreation, range, timber, and minerals (mining and exploration) uses on the quality and quantity of municipal water supplies.

The planning question was formulated initially in response to potential adverse effects of mining and exploration activity on the quality of the municipal water supplies. There is a concern that minerals, timber management, and grazing activity is increasing and can degrade water quality.

PLANNING QUESTION 10: How should the Forest respond to the increasing demands for water?

The scope of the planning question includes public issues and management concerns for surface and groundwater management. Surface water on the Forest is a national concern due to the Forest's location at the headwaters of the Colorado River. Runoff from this area is critical to the water supply of the southwest United States, where much of the water generated on the Forest is used. There is an increasing demand for water on the western slope. New industries also require additional water.

PLANNING QUESTION 11: How should the Forest coordinate mineral development activity with other resource values?

This planning question addresses the potential effects of minerals development on all the other resources, particularly wilderness, wildlife, water, and visual, and how management of other resources may impact mineral development.

The planning question was formulated from issues and concerns identified during scoping and comments to the DEIS relating to increased mineral exploration and development activity throughout the Forest. Several commentors to the Draft EIS and Proposed Plan felt there were no provisions for conflict resolution where minerals are the highest and best multiple-use activity. Response to this concern is included under Comment 7, Planning Question 11, Chapter VI of this document.

PLANNING QUESTION 12: What type of transportation system is necessary to manage the Forest and its resources?

This planning question addresses the transportation requirements needed to manage all resources. Public issues indicate environmental damage is occurring from indiscriminate motorized vehicle use. This dispersed motorized recreation use is also interfering with other resource uses.

PLANNING QUESTION 13: How should the Forest handle the problems caused by private land within and adjacent to the National Forest?

Public issues and management concerns relating to land adjustments either express a desire for more access to the Forest or identify conflicts between private land in or adjacent to the Forest. There are about 1,600 private acres within existing wilderness areas on the Forest.

PLANNING QUESTION 14: Where should the Forest provide utility corridors and how should they be managed?

This planning question addresses Forest land used for rights-of-way for major transmission lines. The primary concern is impacts on resources created by these utility rights-of-way.

PLANNING QUESTION 15: Can service to the public and administration be improved with Forest or District boundary changes?

This planning question addresses the possibility of recommending District or Forest boundary changes; land exchange opportunities between the Forest Service and Bureau of Land Management (BLM); and between the Forest Service and National Park Service.

PLANNING QUESTION 16: How should the Forest manage significant cultural resources (and other special interest areas)?

The planning question addresses cultural resource protection. The concern is that damage to significant and unevaluated prehistoric and historic sites can occur with management activities in an area.

PLANNING QUESTION 17: How should the Forest manage the visual resource?

This planning question addresses the adoption of visual quality objectives for National Forest System land. The concern is that unless the visual resource is considered during planning and project activities, negative visual impacts are likely to occur.

#### CHANGES BETWEEN DRAFT AND FINAL EIS

The Draft EIS and Proposed Plan were filed with the EPA October 25, 1982. Subsequently, nine open house meetings and two public hearings were conducted. Numerous articles were published in local and regional newspapers. Forest officials made radio and television appearances discussing the Proposed Plan.

Members of the public and other government agencies commented on the Draft EIS and Proposed Plan. A total of 249 government and non-government letters, 73 hearing statements and two government resolutions were received. The comments on the Draft EIS and Proposed Plan covered a variety of topics. Comments and Forest Service response are displayed in this Final EIS Chapter VI.

The annual programmed sales offered during the first decade has been revised. Three hundred fifty million board feet of timber will be offered for sale during the period 1984 through 1993. To respond to local interest in accelerating the timber harvest schedule, 35 MMBF will be offered in 1984, and 55 MMBF will be offered annually in 1985 through 1987. A review of the local demand situation will be made prior to the end of 1987 to determine if local demand for timber has significantly changed. If local demand for timber changes significantly, the Plan will be reanalyzed as required by NFMA Regulation 36 CFR 219.10(c). If local demand has not significantly changed, the remainder of the 350 MMBF planned for the decade will be offered in 1988 through 1993 at a rate of 25 MMBF annually. Any of the volume offered but not sold in the first 4 years will still be available for re-offer.

Another alternative was added for Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area. The alternative was added to provide an opportunity to schedule outputs for the Further Planning Area and Wilderness Study Area because of their current legislative and administrative status.

The boundary of the suitable portion of Cannibal Plateau Further Planning Area has been revised. The boundary was revised to reduce potential management conflicts with the Bureau of Land Management proposed Powderhorn Wilderness.

Separate legislative EIS' for Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area will be prepared. The legislative EIS' will be submitted to the Washington Office of the Forest Service. The Regional Forester's recommendation will receive further review and possible modification in the offices of the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States.

Eighty percent of the non-government comments on the Draft EIS and Proposed Plan dealt with Fossil Ridge Wilderness Study Area or Cannibal Plateau Further Planning Area. The reader is encouraged to review Appendix K and L of this Final EIS. Appendix K indexes the Fossil Ridge Wilderness Study Area. Locations are displayed to help the reader locate detailed information on Fossil Ridge. Appendix L indexes Cannibal Plateau Further Planning Area in a similar manner.

Incremental alternative present net value changed between the Draft and Final EIS. The revised Region 2 benefit value for range \$10.48 per aum was substituted for the receipt value of \$1.97 used in the Draft. Although the receipt value was used in the MVEST runs for the Draft, the specified Region 2 benefit value was used to value range in FORPLAN. The result is an increase in the discounted benefits for range.

A second factor affecting the increase in present net value is the projected increase in demand trends for future wilderness use. The result is greatly increased benefits with no increase in costs.

The changes between the Draft and Final EIS are grouped into three categories:

- Changes in the implementing regulations for the National Forest Management Act;
- Content changes in the documents;
- Issues to be addressed in the Final EIS.

#### NFMA REGULATION CHANGE

The Proposed Plan was prepared under the 1979 NFMA implementing regulations. In November 1982 revised regulations became effective. The revised regulations contain provisions for a transition period. The revised regulations (36 CFR 219.29(b)) state: "...planning process steps already completed need not

be repeated." and "if, prior to the effective date of an amendment to this subpart, a forest plan either has been approved in final form or released in draft form for public review, the plan need not be modified to incorporate requirements of such amendment, until the next scheduled revision of the forest plan;."

The Proposed Plan was filed prior to the 1982 regulations effective date. When the Grand Mesa, Uncompahgre and Gunnison National Forests Plan is scheduled to be revised it will be brought into conformance with the 1982 regulations.

The Final EIS and Plan have been revised, where practicable, to meet the intent of the 1982 regulations. The 1982 regulations changed the name of the Regional Plan to Regional Guide. The proposed Rocky Mountain Regional Plan referenced in the Draft EIS is now referred to as the Rocky Mountain Regional Guide. The Regional Guide and Final EIS were filed with the Environmental Protection Agency on June 1, 1983.

#### CONTENT CHANGES

Content has been revised in this Final EIS to reflect new data, revised management direction and implementing schedules, public comments and goal clarification.

Some commentors disagreed with data or analysis displayed in the Draft EIS. These are considered opposing views under the NEPA regulations. Opposing views have been incorporated throughout the Final EIS. The responsible official will consider these opposing views when making his final decision. Opposing views that have been added to the Final EIS include:

- Constraints on Benchmark analysis give inaccurate results and make them inappropriate for comparison;
- Disagree with data, analysis, and display for Fossil Ridge Wilderness Study Area or Cannibal Plateau Further Planning Area;
- The management indicator species list is too limited;
- The criteria for determining capable timberland is too low;
- Timber harvest levels are too high;
- Timber harvest levels are too low;
- Clearcutting to increase water yield will cause erosion and turbidity impacts;
- Harvesting timber to increase water yield is shortsited and is being used to rationalize timber harvest levels;
- The fifty year proposed water projections are too high;
- The Proposed Plan will destroy the tourist industry for Gunnison County;
- Downhill skiing demand projections are too high;
- Timber should be managed for unevenaged stands;
- Mineral leasing should not be permitted on slopes over 40%;
- Utility corridors are not discussed in any of the alternatives;
- Discount rates used in the economic analysis are too low; and
- The Proposed Plan will prevent economic development in the planning area.

The set of Management Prescriptions has been revised to respond to public comments and management concerns. Prescriptions 6C and 6D have been deleted. These prescriptions duplicated Management Direction in a number of other prescriptions and the Forest Direction. Management Prescriptions 5A and 5B were added to make winter range management more site specific. Public and management alike were confused on the location of winter range direction in the Plan. Prescription 7F has been combined with Prescription 7E. Riparian area management is displayed in Prescription 9A in the Final EIS. It was included in Forest Direction in the Draft EIS. Prescription 9B is now displayed on alternative maps. Prescription 10E was added for the Fruita Division Municipal Watershed.

Some land use allocations have been adjusted, in some cases the adjustments are in response to public comments. Other changes were initiated to facilitate plan implementation.

In Chapter II, in the section 'Alternatives Considered and Eliminated from Detailed Study', the Departure from Base Sale Schedule has been revised. The Departure displayed in the Final EIS was developed to respond to a local comment requesting the timber harvest schedule be accelerated.

The importance of vegetation and its relationship to other resources on the Forest has been highlighted. Alternatives in Chapter II have vegetation treatment goals. Chapter III displays current vegetation conditions and what will happen to the vegetation with and without treatment. Chapter IV displays how vegetation treatment contributes to a healthy Forest. Vegetation treatment contributions to other resources are displayed in Chapter IV. Some goals were reworded and new goals added to clarify management direction.

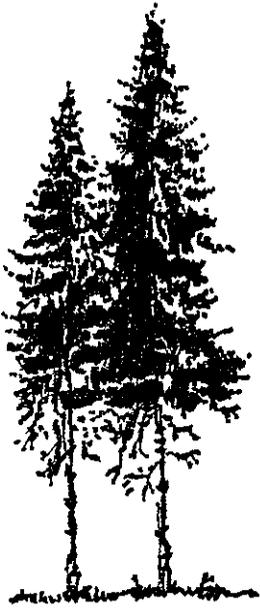
#### ISSUES TO BE ADDRESSED

The Draft EIS was designed to respond to 17 planning questions developed during the Forest planning process. Public comments on the Draft EIS are organized by these planning questions and displayed in Chapter VI. In addition to the planning questions, comments on seven other topics are displayed in Chapter VI. These topics are:

- Alternative Selection;
- Prescriptions;
- Benchmark/NEPA Process;
- Research;
- Miscellaneous;
- Social, Economic, Net Public Benefits;
- Monitoring;

#### RESULTS OF CHANGES IN THE FINAL EIS

Changes between the Draft and Final EIS were necessary to clarify information, revise data and to respond to public comments on the Draft EIS.



## II. Alternatives Including the Proposed Action

CHAPTER II  
ALTERNATIVES INCLUDING THE PROPOSED ACTION

OVERVIEW

This chapter is the heart of the Final EIS. It describes and compares the range of alternatives analyzed in the Forest planning process, including the Proposed Action. The section, Criteria Used to Develop Alternatives, explains the NEPA and NFMA regulations that govern alternative development. It discusses how alternatives were formulated, the range of alternatives, and the set of management prescriptions in each alternative. The section also discusses the role of economics in alternative formulation. The section, Benchmark Levels, describes the benchmark levels and their quantitative analysis. This is used to define the decision space used in formulating alternatives. The section, Alternatives Considered and Eliminated from Detailed Study, describes the mineral leasing alternative and the departure from Base Sale Schedule alternative and reasons for eliminating them from detailed study. The next section displays the nine alternatives considered in detail. This includes the Proposed Action. The alternatives are summarized with emphasis, goals, land use allocations, and the expected future condition of the Forest. The chapter concludes by comparing the nine alternatives considered in detail. This comparison includes planning questions, land use allocations by management prescription, average annual outputs of selected resources, and detailed comparison of resources for a selected time period. The comparison also displays social and economic effects of implementing the alternatives.

CRITERIA USED TO DEVELOP ALTERNATIVES

The NEPA regulations require rigorous exploration and objective evaluation of all reasonable alternatives to the Proposed Action including a "no action" alternative. The regulations require the Forest to analyze alternatives not within the agency's jurisdiction. The regulations also require identification and discussion of alternatives eliminated from detailed study.

The NFMA regulations include criteria to guide alternative development. These criteria are:

- Each alternative will be capable of being achieved.
- A "no action" alternative will be formulated that is the most likely condition expected to exist in the future, if current management direction continues unchanged.
- Each alternative will provide for the orderly elimination of backlogs of needed treatment for the restoration of renewable resources as necessary to achieve the multiple-use objectives of the alternative.
- Each public issue and management concern will be addressed in one or more alternatives.
- Each alternative will represent, to the extent practicable, the most cost-efficient combination of management activities that can meet the objectives established in the alternative.

The NFMA regulations also require that each alternative display:

- The condition and uses that will result from long-term application of the alternative.
- The goods and services to be produced, and the timing and flow of these resources outputs.
- Resource management standards and guidelines.
- The purposes of the management direction proposed.

An alternative is a specific combination of management prescriptions and associated cost and output schedule. Management prescriptions apply only to National Forest System land. A variety of prescription combinations are possible in formulating a reasonable range of alternatives.

Prescriptions are management activities selected for specific land areas to attain multiple-use goals and objectives. Alternatives vary by changing acres and prescription location. Prescriptions for the Management Areas are displayed in Chapter III, Management Direction, of the Plan. Appendix N displays a prescription that was used in alternative formulation, but was not used in the Proposed Action.

The prescriptions contain mitigation measures. Mitigation ensures long-term land productivity is not impaired under any alternative.

Federal agencies are required to include and discuss appropriate measures to mitigate adverse environmental impacts (40 CFR 1502.14 and 16.)

Mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments. (40 CFR 1508.20)

Chapter III, Management Direction, the Forest Plan, contains goals, objectives and management requirements necessary to achieve these goals and objectives. Management requirements are presented in two sections. The first section contains Forest Direction which details overall management requirements that must be maintained during Plan implementation. The second section contains management prescriptions detailing the management requirements for specific Forest land areas called management areas. The management require-

ments listed in Forest Direction are applied in addition to the management requirements for individual management areas. Individual management areas are identified on management area maps attached to the Plan.

The alternatives presented in this Final EIS were formulated using different combinations of management areas and associated management requirements. Mitigation measures were incorporated into the management requirements. The management requirements set the baseline that must be maintained throughout the Forest in achieving the goals and objectives of the Forest Plan. They establish the environmental quality requirements, natural and depletable resource use standards, and mitigating measures that apply to all Forest Areas. Each alternative is economically efficient in terms of present net value (PNV) and benefit/cost ratio. Present net value is total discounted benefits minus total discounted costs associated with providing outputs.

A qualitative assessment of the alternatives is important. To conduct this assessment non-monetary values must also be considered. Net public benefit is the criterion used to evaluate the overall effect of monetary and non-monetary costs and benefits. Net public benefit is the overall value to the Nation of all benefits less all associated costs.

Constraints were formulated for each alternative. They ensure that contributions to net public benefit, not adequately recognized in the present net value calculations, are incorporated into the linear program model (FORPLAN). A detailed discussion of the FORPLAN model is presented in Appendix B.

Benchmark 3 will be used to compare present net value between the alternatives. This Benchmark level is used because it maximizes present net value of those outputs that were assigned a monetary value in the 1980 RPA program. This benchmark includes values for recreation, wilderness use, wildlife and fish, range, timber, and water. Appendix C displays the results of Benchmark level analysis.

The highest present net value alternative does not necessarily ensure selection of that alternative as the Forest's Proposed Action. Net public benefit must be considered. A detailed discussion of the economic analysis and analytical process used in the Forest planning process is included in the Forest planning records and Appendix E.

Values are applied to outputs that are sold or could be sold if Forest Service policy or legislation permitted sale. These include: recreation, wilderness use, wildlife and fish, range, timber, and water. Appendix B displays the values used in the analysis.

Economic effects and impacts will include population, income, employment, and payments to local, county, and State government.

The Formulation of Alternatives (Planning Action 5) is the culmination of Planning Actions 1 through 4. The following summarizes these steps.

Step 1 Major public issues are identified through public involvement and coordination with other local, State and Federal agencies. Management concerns were identified through an internal analysis.

- Step 2 Public issues and management concerns are consolidated into a set of general planning questions to be addressed in the planning process.
- Step 3 Multiple-use management prescriptions were developed. These prescriptions represent sets of compatible management practices, designed to address planning questions in an economically efficient manner.
- Step 4 Data was collected, assembled and stored in the Forest resource data base.
- Step 5 Potential locations for applying the management prescriptions were identified through site-specific capability and suitability analysis.
- Step 6 Potential production levels were estimated for each resource through benchmark analysis. Benchmark levels defined the range within which alternatives could be developed.
- Step 7 Demand and supply levels were estimated for the various resources. The need to change current management direction was identified.
- Step 8 A broad range of possible alternatives was developed. These alternatives address the needed changes in management direction. Each alternative reflected a unique set of objectives for resource management which responds to planning questions differently.
- Step 9 The linear program model, FORPLAN, was used to estimate the goods and services that could actually be produced by each alternative. The model is a mathematical process that determines the most cost-efficient prescription mix which achieves a desired goal. The model schedules outputs and costs over time.
- Step 10 The land management allocations, output schedules, and effects were validated. Unacceptable management conflicts were resolved.
- Step 11 The land management allocations were mapped and re-analyzed to test the original constraints and to insure maximum economic efficiency.
- Step 12 Steps 9 through 11 were repeated to define the reasonable range of alternatives that assured the most cost effective method of achieving alternatives objectives.

#### BENCHMARK LEVELS

Benchmarks can best be described as analytic or information packages from which to develop implementable alternatives. Benchmarks are reference points used for comparison with alternatives. For example, such reference points will indicate the highest amount of sustained capacity for dispersed recreation given a certain set of assumptions. This same assessment will also reveal the tradeoffs in other resources and effects resulting from this amount. The level of outputs resulting from this analysis reflects the upper limit of the decision space within which alternatives will be considered.

Without the knowledge of certain management possibilities and subsequent environmental effects, alternative development is extremely difficult to accomplish with any degree of reliability that resolution of issues are being fully addressed.

Benchmark information is also used in assessing costs associated with certain minimum management requirements such as maintenance of long-term productivity of the land.

Key implementation and assessment factors such as spatial feasibility of management areas, environmental and social effects, program staffing and budget implications, and transportation requirements are estimated, but they are not analyzed in sufficient detail to determine the practicality of actual implementation.

As such, benchmarks only approximate what could actually be accomplished on the ground. They are technically, but not necessarily, operationally implementable. They, therefore, are approximately implementable.

Eleven benchmark levels were analyzed. Each benchmark level is subject to the laws and regulations that govern National Forest System Management; however benchmarks are not constrained by local, regional, or national policy. All benchmarks are designed to maintain land productivity.

Constraints vary by benchmark, but are applied to help ensure that each benchmark can be implemented. These constraints are presented in Appendix C.

Each benchmark has a specific objective. This objective is reflected in the objective function, constraints, and the assumptions made for that benchmark. Benchmarks 1 through 7 are modeled in FORPLAN, Benchmarks 8 through 11 are not modeled in FORPLAN. Appendix C, a benchmark comparison, presents economic analysis and average annual output by resource.

#### MINIMUM LEVEL (BENCHMARK #1)

This Benchmark level estimates a minimum level of management. It will comply with applicable laws and regulations, including prevention of significant or permanent impairment of long-term land productivity, and which would be needed to maintain the Forest as part of the National Forest System and to manage uncontrollable outputs and uses. Management activities that occur at this level include fire suppression, insect & disease control where needed to protect values in adjacent land ownership, law enforcement, and special use management. Incidental outputs include dispersed recreation, wildlife, and water yield. This Benchmark is used to distinguish between non-induced and induced outputs and effects.

The following conclusions can be drawn from Benchmark 1. There is a net decrease in water yield and potential National Forest System winter range carrying capacity when vegetation management is halted. No outputs requiring Forest Service funding will be produced. Dispersed recreation, wilderness use, wildlife, fish, and water will continue to be available on the Forest but below current levels. Downhill ski areas will close and the industry will be eliminated.

Implementing minimum level management would result in lost opportunities to treat vegetation for improved wildlife habitat, increased water yield, improved scenery, improved range conditions and wood fiber. Forested areas would become over-mature and would deteriorate. Susceptibility to insect and disease epidemics with the potential of destroying vast acreages of trees would increase.

Although some dispersed recreation would occur the amount would drop dramatically as the quality of the Forest environment diminished. The quality of scenery would be reduced as would big game habitat and accessibility within the forest. All of these things influence the type, quality, and amount of recreation occurring on the Forest. Over 50% of the jobs in the local economy, dependent on recreation opportunities on National Forest would be lost.

Many grazing permittees are dependent on National Forest System grazing to supplement their livestock operation. Some will be immediately put out of business, others may consolidate available private, State, or other Federal grazing opportunities and remain in business.

Many local sawmill operators are dependent on National Forest System timber. Many operators will likely be forced out of business. Some operators may be able to rely on private, State, or other Federal timber to remain in business. The supply of timber is minimal from these sources.

New public issues will result from minimum level management. People will find access to the Forest reduced and in some cases eliminated. Wildlife habitat improvements will be eliminated. No developed recreation opportunities will exist. If the Forest is to remain open other agencies at the State and local level will have to assume road maintenance responsibilities.

#### MAXIMUM PRESENT NET VALUE BASED ON ESTABLISHED MARKET PRICES (BENCHMARK #2)

This Benchmark estimates the maximum present net value that would be attained by valuing only those outputs having an established market price. Dollar values are based on actual market prices ("willingness to pay").

The following conclusions can be drawn from Benchmark 2. The first decade timber harvest is 22 million board feet (MMBF) per year. This is the minimum harvest level required for this Benchmark. The most economically efficient level of range production is 405,700 animal unit months (AUM's) a year and developed recreation capacity is 656,000 recreation visitor days (RVD's) a year.

Management for market output resources will contribute to increased outputs for non-market goods. Potential National Forest System winter range carrying capacity increases by 15% and dispersed recreation capacity increases by 40%. The increases are a result of timber management activities. As aspen is harvested, plant species favorable to big game are established on the site. The increased food availability has the potential to increase the National Forest System winter range carrying capacity. Timber management requires road construction in areas which are not currently roaded. The additional roads

increase capacity for motorized recreation. The capacity for non-motorized recreation decreases, however the overall dispersed recreation capacity increases. Present net value increases by 42% and the cost to produce the outputs is 15 times greater than Benchmark 1 over the first 10 years.

In their comments on the Draft EIS The Colorado Open Space Council, The National Audubon Society, and The Wilderness Society objected to imposing the 22 MMBF timber harvest floor constraint, decade 1, in this Benchmark. To respond to these comments Benchmark 2 was reanalyzed with the 22 MMBF harvest constraint eliminated. The results of the reanalysis, with a 4% discount rate are: Present value costs total \$129.4 million, present value benefits total \$306.0 million, incremental PNV totals \$176.7 million with a 2.36 benefit cost ratio.

Eliminating the harvest floor constraint in Benchmark 2 raises the incremental PNV \$2.7 million.

All figures referencing Benchmark 2 in this document will retain the 22 MMBF harvest level floor. This constraint is retained to ensure Benchmark 2 meets the criteria of being approximately implementable.

#### MAXIMUM PRESENT NET VALUE INCLUDING ASSIGNED VALUES (BENCHMARK #3)

This Benchmark level estimates the mix, output, and cost schedule which will maximize the present net value resulting from outputs that have an established market price and market outputs that are assigned values. Dollar values are based on actual or simulated market prices for market and non-market outputs.

The purpose of the maximum PNV Benchmark level is to provide a basis for computing the opportunity costs (net benefits foregone) of the alternatives. The difference between the PNV of this benchmark level and the PNV of each alternative is the opportunity cost of that alternative. The PNV trade-off analysis, along with the economic impact analysis and cost-efficiency summary of the alternatives, is displayed in the last section of this Chapter. Present Net Value trade-off is also presented in Appendix E.

The following conclusions can be drawn from Benchmark 3. The first decade timber harvest is 22 MMBF/yr. This is the minimum harvest level required for this Benchmark. Water yield increases are due to the acres clearcut in the Benchmark. The most economically efficient range production level is 401,100 AUM's a year. Dispersed recreation capacity is economically efficient at 1,102,600 RVD's. The most efficient National Forest System winter range carrying capacity is 89,500 animals for the first decade.

The groups commenting on the Draft EIS that objected to imposing the 22 MMBF timber harvest floor constraint in Benchmark 2 raised the same objection for Benchmark 3. To respond to these comments Benchmark 3 was reanalyzed with the 22 MMBF harvest constraint eliminated. The results of the reanalysis, with a 4% discount rate are: Present value costs total \$95.0 million, present value benefits total \$303.6 million, incremental PNV totals \$208.7 million with a 3.20 benefit cost ratio.

Eliminating the harvest floor constraint in Benchmark 3 raises the incremental PNV \$5.1 million.

All figures referencing Benchmark 3 in this document will retain the 22 MMBF harvest level floor. This constraint is retained to ensure Benchmark 3 meets the criteria of being approximately implementable.

#### MAXIMUM TIMBER LEVEL (BENCHMARK #4)

This Benchmark level estimates the maximum timber output capabilities of the Forest. This will establish the biological potential without impairing land productivity. The timber output schedule is the maximum that could be produced in the first decade, subject to a maximum 25% departure per decade. All land classified capable, available, and tentatively suitable for timber production was used in the analysis. Benchmark 4 is designed to determine the maximum timber volume that can be scheduled for harvest.

The following conclusions can be drawn from Benchmark 4. No alternative will schedule more than 122.3 MMBF for harvest annually in the first 10 years. Benchmark 4 considers timber producing activities more efficient than non-timber producing activities. If the model has a choice between a timber harvest and a non-timber harvest prescription, it will choose the timber harvest prescription. There is no change in the recreation or wilderness outputs. National Forest System winter range carrying capacity of Benchmark 4 is 56% less than Benchmark 3.

#### MAXIMUM RANGE LEVEL (BENCHMARK #5)

This Benchmark level estimates the maximum range output capabilities of the Forest. This will establish the upper limit for range production without impairing land productivity. Timber harvest will be used to help achieve the maximum range outputs. Timber harvest is subject to a maximum 25% departure per decade.

All land classified capable, available, and suitable for timber production was used in the analysis. All land classified capable, available, and suitable for range production was used in the analysis. Benchmark 5 is designed to determine to maximum livestock grazing output that can be produced.

The following conclusions can be drawn from Benchmark 5. No alternative will schedule more than 497,200 AUM's of grazing annually in the first 10 years. The benchmark considers livestock producing activities more efficient than activities that do not produce livestock grazing opportunities. If the model has a choice between a grazing and a non-grazing prescription it will choose the grazing prescription.

#### MAXIMUM DISPERSED RECREATION LEVEL (BENCHMARK #6)

This Benchmark level estimates the maximum dispersed recreation output capabilities of the Forest. This will establish the upper level for dispersed recreation capacity. This benchmark includes motorized and non-motorized use, it does not include wilderness use. Benchmark 6 is designed to determine the maximum dispersed recreation capacity the Forest can provide.

The following conclusions can be drawn from Benchmark 6. This benchmark considers dispersed recreation producing activities more efficient than activities that do not produce dispersed recreation opportunities. No alternative will schedule more than 4,237,600 RVD's of dispersed recreation annually the first 10 years.

#### MAXIMUM NATIONAL FOREST SYSTEM WINTER RANGE CARRYING CAPACITY LEVEL (BENCHMARK #7)

This Benchmark level estimates the maximum National Forest System Winter Range Carrying Capacity output capabilities. This will establish the upper limit for winter range carrying capacity. Timber harvest will be used to help achieve the maximum winter range carrying capacity. Timber harvest will be subject to a maximum 25% departure per decade. Benchmark 7 is designed to determine the maximum National Forest System winter range carrying capacity the Forest can provide.

The following conclusions can be drawn from Benchmark 7. No alternative will provide winter range for more than 93,300 elk and deer annually, in the first 10 years. Timber harvest at this level enhances winter range carrying capacity, 72.3 MMBF are scheduled for harvest annually.

#### MAXIMUM DEVELOPED RECREATION LEVEL (BENCHMARK #8)

This benchmark level estimates the maximum developed recreation capacity needed to meet demand. This will establish the upper limit for developed recreation capacity. Outputs will be produced at existing and proposed National Forest System developed recreation sites. The sites will be managed at the full service management level.

Benchmark 8 is designed to determine the maximum developed recreation capacity of the Forest. The following conclusion can be drawn from Benchmark 8. Existing site capacity is 744,000 RVD's annually. To increase above this total additional developed recreation sites will be required. Demand will be 1,280,000 RVD's annually by year 2030.

#### MAXIMUM WINTER SPORTS LEVEL (BENCHMARK #9)

This benchmark level estimates the maximum downhill skiing output capabilities of the Forest. This will establish the upper limit for downhill skiing. Outputs will be produced at existing and proposed downhill skiing sites.

Benchmark 9 is designed to determine the maximum downhill skiing capacity on the Forest, limited to existing and proposed sites. The following conclusion can be drawn from Benchmark 9. Potential capacity is 315,500 RVD's or 35,200 skiers at one time. To increase above this level additional downhill ski areas will be required.

#### MAXIMUM WILDERNESS LEVEL (BENCHMARK #10)

This benchmark level estimates the maximum capacity for existing wilderness, Fossil Ridge Wilderness Study Area, and Cannibal Plateau Further Planning Area. This will establish the upper limit for wilderness capacity.

Benchmark 10 is designed to determine the maximum wilderness capacity on the Forest. The following conclusion can be drawn from Benchmark 10. Total capacity including Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area is 417,619 RVD's annually. No alternative will reflect a higher capacity.

MAXIMUM WATER YIELD LEVEL (BENCHMARK #11)

This benchmark level estimates the maximum water yield that can be produced on the Forest while still maintaining land productivity. This will establish the upper limit for water yield. Timber harvest, vegetation treatment, snowpack management, and structural improvements will be used to enhance water production.

This benchmark assumes all tentatively suitable forest land on slopes less than 40%, one-third of the tentatively suitable timber land on slopes greater than 40%, and one-third of the non-forest land on slopes less than 40% are capable of management for increased water yield. Wilderness acreage is not capable of increased water yield. Some openings may be designed to minimize water yield in sensitive watersheds.

Benchmark 11 is designed to determine the maximum water yield increase the Forest is capable of producing. The following conclusion can be drawn from Benchmark 11. The maximum water yield increase potential from vegetation treatment on both suitable forest land and non-forest land is an average annual increase of 125,000 acre-feet by the end of the 50-year planning horizon. Table II-1 displays average annual increased water yield by decade.

The fifth decade value (125,000 acre-feet/year) represents a potential increase of 4.4% over current water yield by the year 2030. If accomplished, total annual water yield would be about 2,994,000 acre-feet.

TABLE II-1.

INCREASED WATER YIELD  
(Average Annual)

	Time Period				
	1981-1990	1991-2000	2001-2010	2011-2020	2021-2030
Thousand Acre-Feet	39.3	64.1	85.6	105.9	125.0

Benchmark level analysis defines the feasible decision space used to formulate alternatives. Appendix C presents benchmark level analysis. Table II-2 displays the maximum and minimum resource output levels and budget requirements in the benchmark analysis.

TABLE II-2.

MAXIMUM AND MINIMUM OUTPUT LEVELS  
DERIVED FROM BENCHMARK LEVEL ANALYSIS  
(Summary All Decades, Average Annual)

Resource Output	Units**	Maximum Quantity	BM*	Minimum Quantity	BM*
<b>Recreation</b>					
Developed	MRVD	1,280.0	8	0	1
Dispersed	MRVD	9,749.2	6	887.5	1
Winter Sports	MRVD	3,872.0	9	0	1
<b>Wilderness</b>					
Management	Thousand Acres	581.2	10	501.8	1
Use	MWVD	173.0	10	97.9	1
<b>Wildlife</b>					
NFS** Winter Range Carrying Capacity	Thousand Animals	93.4	7	77.3	1
<b>Range</b>					
Grazing Use	MAUM	499.9	5	0	1
<b>Timber</b>					
Programmed Sales Offered	MMBF	176.9	4	0	1
<b>Water</b>					
Increased Yield	MAF	73.6	11	0	1
<b>Economic Analysis</b>					
Incremental PNV (4%)	MM\$	219.2	3	NA	NA
Budget Require- ments	M,1978\$	NA	NA	351.0	1

\* Indicates benchmark level used to establish the output level.

\*\* MRVD = Thousand Recreation Visitor Days      NFS = National  
 MWVD = Thousand Wilderness Visitor Days      Forest  
 MAUM = Thousand Animal Unit Months      System  
 MMBF = Million Board Feet  
 MAF = Thousand Acre Feet  
 MM\$ = Million Dollars  
 M,1978 \$ + Thousand 1978 Dollars

ALTERNATIVES CONSIDERED AND ELIMINATED FROM DETAILED STUDY

A mineral leasing alternative and an alternative departing from Base Sale Schedule were analyzed and eliminated from detailed study.

MINERAL LEASING

The maximum mineral leasing alternative assumes all National Forest System land covered in this Final EIS is available for leasing. Chapter I displays the National Forest System land covered in this Final EIS. Table II-3 displays the acres recommended available for mineral leasing in this alternative.

TABLE II-3.

MAXIMUM MINERAL LEASING ALTERNATIVE

Land Classification	Acres
Unclassified Land	2,369,497
Wilderness	453,618
Cannibal Plateau Further Planning Area	31,990
Fossil Ridge Wilderness Study Area	47,400
Other Special Management Land	2,522

There are 373,024 unclassified acres (13%) rated low potential for reclamation. In this alternative these acres would be open to exploration and development. Developing isolated areas would cause extensive surface impacts to surrounding land with low reclamation potential. These include access roads, pipelines, electric transmission lines, and geophysical activity.

In Wilderness 382,850 (84%) acres rated low potential for restoration will be available for development.

In Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area 20,525 (26%) acres rated low potential for restoration will be available for development.

In other special management areas 2,520 (100%) acres, which mineral exploration and development would be detrimental or destructive to the special values of the classified area, would be available for leasing.

This alternative is eliminated from detailed study. The alternative is infeasible and unreasonable. It makes areas available for leasing that could not be leased because of environmental or legal constraints.

## DEPARTURE FROM BASE SALE SCHEDULE ALTERNATIVE

Departure from Base Sale Schedule (BSS) is a timber harvest schedule which deviates from the principle of nondeclining even flow by exhibiting a planned decrease in the timber sale and harvest schedule at any time in the future. A departure can be characterized as a temporary increase, usually in the beginning decade(s) of the planning period, over the BSS that would otherwise be established, without impairing the future attainment of the Forest's long-term sustained yield capacity. The purpose of analyzing departure is to evaluate the net public benefits produced through departure from base sale schedule.

Departure can result in increased net public benefit when one or more of the following conditions occur on a National Forest:

- High mortality losses from any cause can be significantly reduced or prevented.
- Timber age or size class distribution can be improved. This will facilitate the attainment of Forest growth at its long-term sustained yield capacity.
- Implementation of the corresponding base sale schedule would cause a substantial adverse impact upon a community in the economic area in which the National Forest is located.
- Other management concerns, public issues, and opportunities suggest a departure as a viable alternative.

Two conditions are known to exist in the Forest. Currently the forest is losing timber volume through natural mortality. Trees are dying faster than they are being replaced and many of the surviving trees are stunted, growth is stagnated and they are becoming even more susceptible to disease. These conditions are present on suitable and unsuitable timberland. The Forest also has poor age and size class distribution. Departure does have the potential to reduce mortality and improve age and size class distribution.

Currently the Forest has an over supply of old growth and an under supply of seedling and sapling stands on suitable timber land. Balancing the age and size class distribution is important to timber growth rate, resistance to insect and disease infestation, reaching long-term sustained yield capacity, and capturing mortality that is currently being lost.

Comments on the Draft EIS and Proposed Plan indicate a third condition may exist. Correspondence commenting on the Proposed Plan indicated a group of investors, to be known as Continental Lumber Company, wish to construct a modern sawmill and planer mill in Montrose, Colorado. Continental indicated that the timber demand figures displayed in the Draft EIS are based on past harvest volumes and have no allowance for future industrial development. Continental stated, "We request that your annual sales program be rescheduled to reflect more total management of the timber resource. An annual sale of 55-60 mmbf saw logs would alleviate the constrictions of timber resource supply and allow justification of the large capital expenditures required to establish a modern process facility."

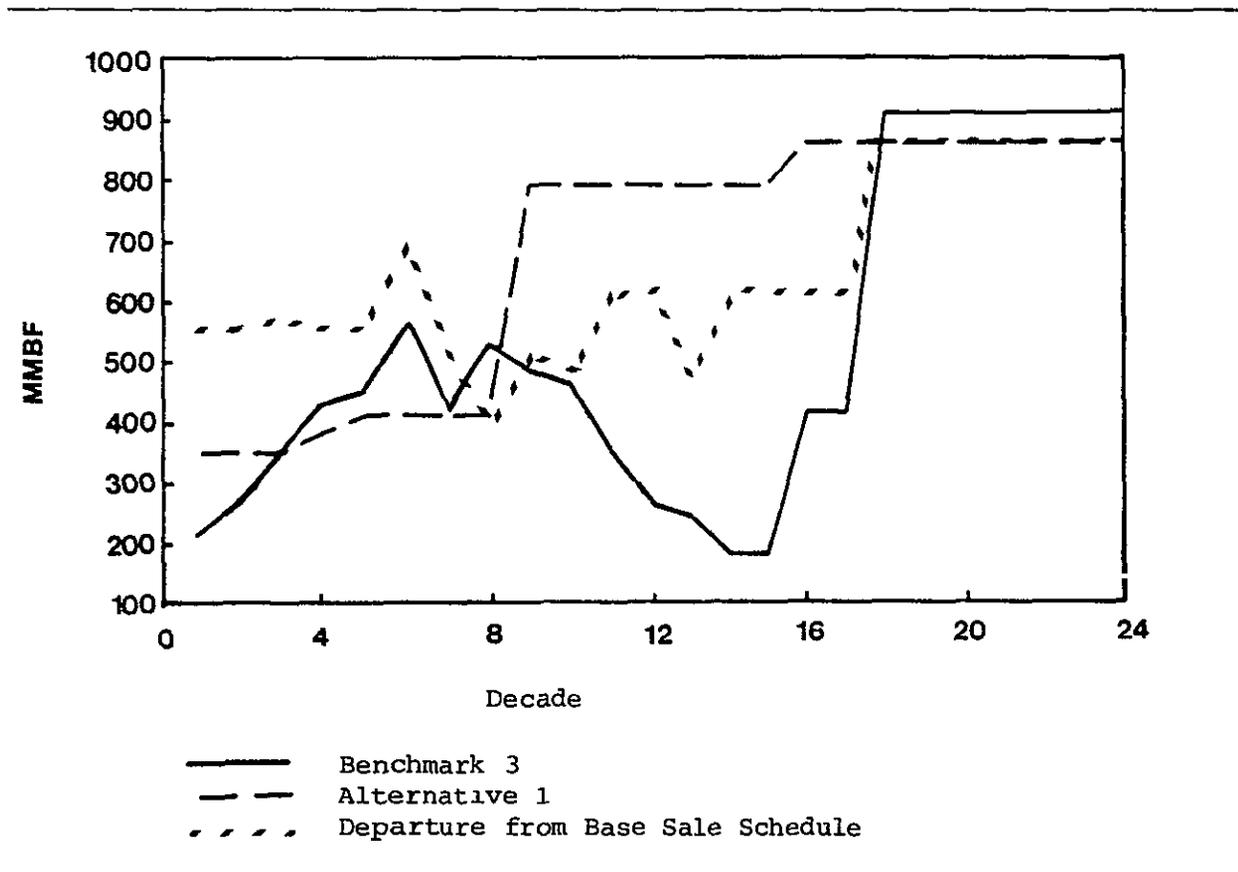
The request to revise the timber harvest schedule was endorsed by the Montrose Chamber of Commerce, Intrawest Banks, Club 20, Mayor of Montrose, City Council of Montrose and the Montrose Board of Commissioners.

Departure from BSS was analyzed. This departure had the same land use allocations and long-term sustained yield capacity as the Proposed Action.

Figure II-1 displays departure management for 240 years. The figure displays the timber output schedule for the Proposed Action and Benchmark 3 as reference points.

FIGURE II-1.

DEPARTURE FROM BASE SALE SCHEDULE



This departure from base sale schedule has been eliminated from detailed study. The anticipated demand for timber, local market conditions, existing mill capacity, and the high roading requirements indicate a departure alternative is not warranted.

Should Continental Lumber Company, or any timber processor, make actual investment commitments at specific locations within the forest's market area demand estimates will be revised. Commitments will include land and facility purchase for a mill or processing unit.

Should the market for timber improve significantly in the future, an additional analysis will be conducted to determine the need for departure from the base sale schedule.

Additional information regarding this departure is displayed in Appendix M.

#### ALTERNATIVES CONSIDERED IN DETAIL

The key element for achieving the goals of these alternatives is a healthy forest. Vegetation treatment levels differ by alternative due to the alternatives emphasis. Vegetation treatment is a management technique in administering the multiple-use resources of the National Forest to attain the overall goal of a healthy, vigorous forest. It is used to adjust existing plant communities to best meet the vegetation needs and resource goals and objectives. Vegetation treatment is accomplished without impairment of land productivity and is guided by the Management Requirements displayed in the Plan. Through commercial and noncommercial treatment activities, vegetation treatment is directed towards the following:

- Providing additional recreation opportunities;
- Providing downhill ski areas;
- Providing public service through utility corridors and electronic sites;
- Increasing opportunities for significant cultural resource discovery;
- Improving visual quality;
- Increasing big game winter range;
- Increasing non-game wildlife habitat diversity by increasing edge;
- Improving range conditions;
- Providing wood fiber;
- Increasing tree growth and vigor;
- Increasing water yield without impairing water quality;
- Increasing the forest's resistance to insect and disease infestations;
- Reducing unwanted fuel accumulations;
- Returning revenue to the U.S. Treasury;
- Maintaining industries dependent on National Forest System land management.

This Final EIS discusses need and rationale for using vegetation treatment. Vegetation treatment is one of the most practical and efficient methods available to achieve goals. Most aspen stands on the Forest were generated by past fires. Most stands are over 80 years old. This coincides with the fire prevention and control activities established by the Forest Service in 1905.

Most aspen stands will not regenerate themselves. They will be replaced by pine or spruce unless cut, burned, or otherwise treated. Aspen is an extremely important species to wildlife and contributes to the visual quality of mountain scenery. Without treatment most aspen stands will not regenerate.

The detailed consequences of not managing the Forest vegetation are presented in Chapter IV. When vast acreages of forest cover are uniformly mature, wildlife diversity is limited to relatively few species dependent on mature forests. Burning, cutting, or other vegetation treatment activities will increase vegetation diversity which will provide wildlife habitat diversity. Treatment also reduces the amount of unwanted fuels. Mature and overmature forests are more susceptible to epidemic insect attack. The attack can spread over large areas creating undesirable effects similar to large burns or clearcuts. If age, size class, and species diversity is enhanced the risk of widespread epidemic is reduced.

Water yield increases also depend on forest resource management. Other outputs and effects as diverse as maintaining visual quality and firewood availability are closely related to the amount of vegetation treated.

Costs associated with vegetation treatment and other activities necessary to achieve the goals stated in these alternatives are significant. It is often difficult to justify the vegetation treatment expense to achieve goals associated with visual quality maintenance, cultural resource discovery, wildlife habitat improvement, insect and disease prevention, water yield improvement, or commercial timber harvest. Doing so may maximize the use of some resources but reduce the total outputs and the long-term potential of other resource uses. Individually the costs are too great and the long-term benefits too small. By applying an integrated approach to management the overall goals are cost-efficient. For example, timber harvest in aspen enhances wildlife habitat diversity, visual quality and returns dollars to the U.S. Treasury. This approach has the added benefit of maintaining existing employment in communities dependent on the timber industry. The fact that all alternatives result in a positive PNV illustrates this point.

In other cases, prescribed burning, firewood removal, or cutting by Forest Service crews and volunteers may be the most efficient way to treat vegetation. Vegetation treatment levels vary by alternative due to the alternatives emphasis.

Vegetation treatment can require road construction. Roads take land out of production and impact the soil and water resources. However, Management Requirements in the Plan, Chapter III, ensure impacts are short-term in all alternatives. An environmental analysis occurs before road construction. Considerations are given to the physical and biological land characteristics as well as the goals of the management area in determining how and where to construct the road. These characteristics include slope, soil erodibility, vegetation cover, wildlife and fisheries protection, stream proximity and visual resource protection. Road use by people, rather than the actual road itself, causes greater impacts on the environment and on other resource uses and activities. Effective travel management provides resource protection and a safe, environmentally sound, and efficient transportation system.

Travel management directs use of existing and future roads in all alternatives. In some areas, no roads will be built. In others, roads will be built, but their use will be restricted. In other instances, roads will be open to public use.

As an example, road construction can open up a previously unroaded area. Road use in this area can impact wildlife seclusion and semi-primitive non-motorized recreation opportunities. Travel management may restrict or close roads leading to, or in, the area based on the goals of the management areas through which the road passes. This road closure or restriction can restore wildlife seclusion, continue semi-primitive non-motorized recreation opportunities but with improved non-motorized access to the area, improve access for other resource activities, prevent unacceptable resource damage and reduce maintenance costs. Public understanding of management area and travel management goals is necessary for public acceptance of area and road closures or restrictions. Additional discussion of travel management is displayed in Chapter III under the "Facilities" section.

Nine alternatives are considered in detail. These alternatives, including the Proposed Action, are presented in this section. Each alternative meets NFMA feasibility requirements. They are economically, technically, budgetarily, and environmentally feasible and reasonable.

The NFMA regulations require alternatives to address public issues and management concerns. Each alternative addresses the set of planning questions differently.

The alternatives represent a broad range of resource outputs and expenditure levels. They address differently the public issues, management concerns, and resource opportunities; through a unique combination of management prescriptions. See Plan, Chapter III for a complete display of the prescriptions. Appendix N displays a prescription used in alternative formulation, but was not used in the Proposed Action.

The linear program model FORPLAN was used to help select the combination of prescriptions in each alternative to maximize present net value, given the alternative goals and constraints. A detailed discussion of the linear program model FORPLAN, is presented in Appendix B. Using FORPLAN meets NFMA requirements that each alternative represent to the extent practicable the most cost-efficient combination of management prescriptions. The prescription combination selected was the most cost-efficient combination in every alternative because the linear program was required to maximize present net value.

Unique constraints were applied in the FORPLAN model for each alternative. Through constraints it was possible to address the different emphasis and goals incorporated in each alternative. This resulted in a unique mix of management prescriptions and outputs for each alternative. Constraints help to achieve timber, range, wildlife, recreation, water, and budget goals; and force the model to schedule certain activities at different times in the planning horizon. Resource outputs were projected for fifty years. Timber harvest was examined for an additional 19 decades beyond 2030 to ensure the timber is managed on a non-declining even flow basis. Constraints common to all alternatives are displayed in Appendix D.

Economics played an important role in selecting the management prescription mix for each alternative. This was accomplished initially through the FORPLAN model. It was run with the objective function of maximizing present net value. If prescriptions were able to satisfy the constraints, FORPLAN would select the most cost-efficient prescription.

Once FORPLAN produced tentative prescription allocations, the Forest management team mapped the solution into a manageable configuration. Once again, economic efficiency was a criterion. It relates to access, transportation system design, administrative costs, and prescription placement on the most productive land to meet the prescription objectives. A detailed discussion of the analytical process and economic efficiency is available in the Forest planning records, and is summarized in Appendix E.

Although the alternatives considered in detail have different outputs, costs, and effects; each alternative represents the most cost-efficient way of meeting the goals of that alternative. Each alternative has also been evaluated for spatial and resource output feasibility.

The linear program model also fulfilled NFMA requirements for the coordination of outdoor recreation, range, timber, water, wildlife and fish, and wilderness. To achieve multiple-use coordination, each alternative must provide an integrated mix of resource outputs.

There are additional outputs which are not included in the FORPLAN model. They are included in the alternative economic efficiency analysis. A computer program, MIVEST, was used to evaluate Forest investment opportunities. This program incorporates all non-FORPLAN benefits and costs into the economic efficiency analysis.

In addition to the following descriptions, one-quarter inch per mile maps are attached to the back cover of this Final EIS. The maps display the spatial distribution of management prescriptions that were selected for each alternative. The alternative maps display corridors for the proposed construction and reconstruction of arterial and collector roads, and corridors for major existing utility routes.

The following descriptions present goals, constraints, and a summary of expected results for each alternative. Chapter IV further describes the expected future condition and environmental consequences resulting from the Proposed Action and Alternatives to it. Appendix J summarizes outputs and activities, for each alternative. Appendix H displays goals and objectives common to each alternative.

The Plan may be revised when conditions or demand in the Planning Area change significantly or when change in RPA Policy, goals, or objectives would have a significant effect on the Forest program. Revisions will not go into effect until considered and approved for the development and approval of a Forest Plan. (36 CFR 219.10(g))

## ALTERNATIVE 1 - (PROPOSED ACTION)

The Proposed Action emphasizes intensive management for market output opportunities. Market outputs provide the opportunity to maintain or enhance the stability of industries needed to produce local and regional goods and services. Range, timber, and water exceed their current output levels. Three hundred fifty million board feet of timber will be offered for sale during the period 1984 through 1993. To respond to local interest in accelerating the timber harvest schedule, 35 MMBF will be offered in 1984, and 55 MMBF will be offered annually in 1985 through 1987. A review of the local demand situation will be made prior to the end of 1987 to determine if local demand for timber has significantly changed. If local demand for timber changes significantly, the Plan will be reanalyzed as required by NFMA Regulation 36 CFR 219.10(c). If local demand has not significantly changed, the remainder of the 350 MMBF planned for the decade will be offered in 1988 through 1993 at a rate of 25 MMBF annually. Any of the volume offered but not sold in the first 4 years will still be available for re-offer.

The alternative will meet 79% of total developed recreation demand at the end of the 50-year planning horizon. This allows the private sector to meet part of the demand for developed recreation. In this alternative 13,599 acres of Cannibal Plateau Further Planning Area and no acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Demand for dispersed recreation opportunities outside wilderness will be met. Trail management and reconstruction is emphasized. Trails, trailheads, and other improvements are constructed or reconstructed to help disperse recreationists. Vegetation treatment is scheduled for approximately 16,100 acres per year during the first ten years.

The goals and objectives of this alternative are:

- Manage vegetation in an economically efficient manner to provide and maintain a healthy, vigorous environment capable of producing a range of multiple-use outputs and conditions; i.e., outdoor recreation, fish and wildlife habitat, livestock grazing, visual quality, water, wood fiber, research, cultural opportunities, and economic benefits to society.
- Meet 50% of increased demand above existing capacity for developed recreation opportunities at the close of the 50 year planning horizon.
- Meet demand for motorized and non-motorized dispersed recreation opportunities outside wilderness areas.
- Disperse recreationists by constructing or reconstructing trails, trailheads, and other improvements.
- Manage 60% of wilderness acres at the full service management level and 40% at the reduced service management level.
- Thirteen thousand five hundred ninety-nine acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System.

- No acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System.
  - Increase National Forest System winter range carrying capacity for elk and deer.
  - Improve wildlife habitat diversity.
  - Schedule a 5% increase in permitted livestock grazing.
  - Increase investments in structural and non-structural range improvements.
  - Increase programmed timber sales offered.
  - Meet the demand for firewood.
  - Increase water supply, while reducing soil erosion and stream turbidity.
- Table II-4 displays the unique constraints in this alternative.

TABLE II-4.

CONSTRAINTS  
(Alternative 1)

Output	Type of Constraint*	Con- straint	Units**	Decade
<b>TIMBER</b>				
Total Volume	GE	70.0	MMCF/Decade	1
		35.0	MMBF/Yr	
Aspen Volume	LE	90.0	MMCF/Decade	5
		45.0	MMBF/Yr	
Sawtimber Volume	LE	7.0	MMCF/Decade	1-5
		3.5	MMBF/Yr	
Spruce-Fir Volume	GE	52.5	MMCF/Decade	1-2
		26.2	MMBF/Decade	
Acres Clearcut Spruce-Fir and Ponderosa Pine	LE	54.0	MMCF/Yr	1-5
		27.0	MMBF/Yr	
Lodgepole Pine	LE	52.5	MMCF/Decade	1-5
		26.2	MMBF/Yr	
Total Clearcut	LE	52.5	MMCF/Decade	1-5
		26.2	MMBF/Yr	
Volume Allowed Full Road Analysis Area	LE	9.0	MMCF/Decade	1-5
		4.5	MMBF/Yr	
Volume Allowed High Road Analysis Area	LE	13.5	MMCF/Decade	1-5
		6.7	MMBF/Yr	
<b>RANGE</b>				
Livestock Grazing	GE	3,330.0	MAUM/Decade	1-5
		3,360.0	MAUM/Decade	
<b>WILDLIFE</b>				
Aspen Habitat Improvement	LE	8,300.0	Acres/Decade	1-5
		5,000.0	Acres/Decade	
Prescribed Burning	GE	55,000.0	Acres/Decade	1-5
		45,000.0	Acres/Decade	

\* LE = Less Than or Equal to  
 GE = Greater Than or Equal to  
 EQ = Equal To

\*\*MMCF/Decade = Million Cubic Feet/Decade  
 MMBF/Yr = Million Board Feet/Year  
 MAUM/Decade = Thousand Animal Unit Months/Decade

Each constraint was analyzed by the Forest management team and interdisciplinary team.

The total timber volume constraints reflect the timber potentials from the two current timber management plans. Thirty-five MMBF/year is the mid-point of the estimated demand projected for the 50 year planning horizon. This volume provides industry the opportunity for economic growth. Total timber volume includes all timber 7 inches in diameter and greater from suitable timber land.

The 45 MMBF/year, less than constraint, is an implicit budget constraint. Because the budget is not a scheduled output, the budget can be controlled by applying a constraint on timber volume that will indirectly control spending. The model was forced to apply range and wildlife prescriptions to Forest areas to improve wildlife habitat and increase livestock grazing. The aspen constraint was based on demand for aspen products in the planning area. The sawtimber volume greater than constraint was established to maintain local industry. The spruce-fir volume upper limit was established so that the linear program model would not cut entirely from spruce-fir sawtimber stands. Appendix E discloses detailed information on economic efficiency.

Clearcut constraints were based on the volumes offered by clearcut harvest methods from past cutting on the Forest. The less than constraint was established to ensure the proportionate clearcut acres to volume annually offered is not significantly increased on the Forest.

Less than constraints were placed on the amount of volume that could be harvested from fully and highly roaded analysis areas. These constraints reflect timber harvested through 1981.

The range objective was to schedule a 5% increase in livestock grazing over current levels. This established an upper limit constraint of 336,000 AUM's per year for the planning horizon. The lower limit ensured that grazing would be increased over present levels in the solution.

The constraints applied to the wildlife resource reflect a long-term wildlife habitat improvement program. Aspen is an important habitat for many wildlife species. Aspen treatment for wildlife habitat improvement involves clearcutting to create diversity. This provides aspen with good spatial and age class distribution. Clearcutting produces edge which benefits wildlife. Aspen constraints were formulated to re-enter aspen stands at periodic intervals. The edge contrast will increase and sustain the wildlife population. The non-structural improvements (prescribed burning) constraints were formulated in the same manner. By re-entering the prescribed burn areas at periodic intervals, the oakbrush growth associated with these areas will be controlled. This will increase available forage for wildlife, particularly deer and elk.

#### Expected Future Condition.

Recreation - The demand for developed recreation opportunities will increase from 617,000 RVD's in 1985 to 1,280,00 RVD's annually by the year 2030. The Forest will reduce the percentage of total demand met over the 50-year

planning horizon from 100% in decade 1 to 96, 89, 82, and 79% in decades 2 through 5. Total developed recreation capacity will increase from 744,000 RVD's annually in decade 1 to 1,012,000 RVD's annually in decade 5.

Approximately 45% of the sites will be operated at the full service management level.

The Forest has a large resource of dispersed recreation opportunities not available in the private sector. Approximately 17% of the Forest is managed for semi-primitive non-motorized recreation. Trail management will be emphasized, 30% of the existing Forest trail mileage will be reconstructed during the first decade (1981-1990). Fifty miles will be constructed or reconstructed annually over the planning horizon.

Wilderness - Wilderness management will emphasize primitive wilderness settings. Thirteen thousand five hundred ninety-nine acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System. This could increase the total wilderness acres on the Forest to 515,376 acres, 17% of the total Forest acres. No acres of Fossil Ridge are suitable for inclusion in the National Wilderness Preservation System.

Fish and Wildlife - National Forest System winter range carrying capacity will increase by 6% over current levels in the first decade. This is due to the aspen habitat management and increased prescribed burning programs. Aspen treatment will be maintained at 500 acres annually, over the planning horizon. Prescribed burning is scheduled for 5,500 acres annually after 1985. The alternative schedules 590,386 acres to be managed for wildlife habitat emphasis.

Range - The alternative schedules the permitted livestock program to increase by 5%, to 335,800 AUM's grazed annually over the planning horizon. Range condition will be good with a stable trend. Grazing capacity is increased by increasing investments in structural and non-structural range improvements.

Timber - The programmed sales offered will be 350 MMBF for the 10-year period 1984 through 1993. This will provide the opportunity for industrial development. In response to public comment requesting a higher level of timber be offered, the annual volume offered will be increased to 55 MMBF for 1985 through 1987. See discussion in opening paragraph of this alternative for further explanation.

Water - The Proposed Action will increase water yields over the first ten years by 10,898 acre feet per year over the current situation. This will be accomplished through vegetation treatment. By the fifth decade water yield will increase by 19,410 acre feet per year or .7% over the current situation.

Minerals - Table II-5 summarizes land available for mineral leasing for Alternative 1. Sixty-two percent of the wilderness acreage is recommended not available for leasing.

TABLE II-5.

MINERAL LEASING SUMMARY  
(Alternative 1)

Area	Leasing Availability Recommendation	Acres
Wilderness*	No Lease	285,992
	Lease with Surface Occupancy	76,418
	Lease without Surface Occupancy	104,807
Unclassified	No Lease	185,494
	Lease with Surface Occupancy	2,041,637
	Lease without Surface Occupancy	210,679

\* Includes the area identified suitable for inclusion in the National Wilderness Preservation System for Cannibal Plateau Further Planning Area.

Facilities - The Forest's transportation system is directly affected by management area direction. Construction or reconstruction in the alternative will occur on 57 miles of arterial roads, 45 miles of collector roads, and 216 miles of local roads during the first ten years. Fifteen bridges will be constructed or reconstructed during the first ten years.

ALTERNATIVE 2 - (CURRENT PROGRAM - NO ACTION)

This alternative projects current management modified by the minimum NFMA requirements and regional policy. This is the "no action" alternative required by the NEPA regulations. It responds to present program levels and provides a basis for comparison of other alternatives. The increased demand above existing capacity for developed recreation opportunities is not met. Current direction schedules dispersed recreation opportunities and wildlife habitat improvement. No acres of Cannibal Plateau Further Planning Area or Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Livestock grazing increases. Wood fiber production and vegetation treatment are used to achieve other resource goals. Programmed timber sales offered equals 28 million board feet per year in the first ten years. Vegetation treatment would occur on approximately 14,200 acres per year during the alternative's first ten years. The current, approved timber management plan on standard and special land is 35 million board feet per year.

The goals and objectives of this alternative are:

- Manage vegetation in an economically efficient manner to provide and maintain a healthy, vigorous environment capable of producing a range of multiple-use outputs and conditions; i.e., outdoor recreation, fish and wildlife habitat, livestock grazing, visual quality, water, wood fiber, research, cultural opportunities, and economic benefits to society.
- Maintain developed recreation capacity at current level.
- Meet demand for motorized and non-motorized dispersed recreation opportunities outside wilderness areas.
- Do not disperse recreationists by constructing or reconstructing trails, trailheads, and other improvements.
- Manage 20% of wilderness acres at full service and 80% at reduced service management level.
- No acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System.
- No acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System.
- Increase winter range carrying capacity for elk and deer.
- Improve wildlife habitat diversity.
- Schedule a 4% increase in permitted livestock grazing.
- Maintain investments in structural and non-structural range improvements.
- Maintain programmed timber sales offered.
- Meet the demand for firewood.
- Increase water supply, while reducing soil erosion and stream turbidity.
- Recommend no area available for mineral leasing in wilderness areas, Cannibal Plateau Further Planning Area, and Fossil Ridge Wilderness Study Area.\*

Table II-6 displays the unique constraints in this alternative.

\* Current management is not recommending land for mineral leasing at this time. This alternative displays the environmental consequences of recommending no area available for mineral leasing in wilderness areas, Cannibal Plateau Further Planning Area, and Fossil Ridge Wilderness Study Area.

Table II-6.

CONSTRAINTS  
(Alternative 2)

Output	Type of Constraint*	Con- straint	Units**	Decade
<b>TIMBER</b>				
Total Volume	GE	56.0	MMCF/Decade	1
		28.0	MMBF/Yr	
Aspen Volume	LE	4.0	MMCF/Decade	1-5
		2.0	MMBF/Yr	
Sawtimber Volume	GE	39.2	MMCF/Decade	1-5
		19.6	MMBF/Yr	
Spruce-Fir Volume	LE	39.2	MMCF/Decade	1-5
		19.6	MMBF/Yr	
<b>Acres Clearcut</b>				
Spruce-Fir	EQ	0.0	Acres/Decade	1-5
Ponderosa Pine	EQ	0.0	Acres/Decade	1-5
Lodgepole Pine	LE	1,500.0	Acres/Decade	1-5
Total Clearcut	LE	4,500.0	Acres/Decade	1-5
<b>Volume Allowed Full Road Analysis Area</b>				
	LE	7.0	MMCF/Decade	1-5
		3.5	MMBF/Yr	
<b>Volume Allowed High Road Analysis Area</b>				
	LE	10.5	MMCF/Decade	1-5
		5.2	MMBF/Yr RANGE	
<b>Livestock Grazing</b>				
	GE	3,700.0	MAUM/Decade	1-5
	LE	3,340.0	MAUM/Decade	1-5
<b>WILDLIFE</b>				
Aspen Habitat Improvement	LE	8,300.0	Acres/Decade	1-5
	GE	5,000.0	Acres/Decade	1-5
Prescribed Burning	LE	55,000.0	Acres/Decade	1-5
	GE	45,000.0	Acres/Decade	1-5

\* LE = Less Than or Equal To  
 GE = Greater Than or Equal To  
 EQ = Equal To

\*\*MMCF/Decade = Million Cubic Feet/Decade  
 MMBF/YR = Million Board Feet/Year  
 MAUM/Decade = Thousand Animal Unit Months/Decade

Each constraint was analyzed by the Forest management team and interdisciplinary team.

The total timber volume constraint reflects the timber volume sold in 1981. The aspen volume and spruce-fir volume constraint reflects the volume sold in 1981. The total sawtimber volume and acres clearcut are proportional to the current timber program. Total volume includes all timber 7 inches in diameter and larger from suitable timber land.

Less than constraints were placed on the timber volume that could be harvested from fully and highly roaded analysis areas. These constraints reflect timber that was harvested through 1981.

The greater than livestock grazing constraint reflects the 1981 level. The less than constraint reflects a scheduled increase in grazing.

The greater than aspen habitat improvement constraint reflects the 1981 output level. The lower limit prescribed burning constraint reflects the projected 1982 level.

#### Expected Future Condition

Recreation - The Forest will not meet demand for increased developed recreation opportunities. Demand will not be met after 1990. Developed recreation capacity will remain at its 1981 level, 744,000 RVD's annually. This provides the private sector the opportunity to supply developed recreation opportunities to meet demand. Approximately 45% of the sites will be operated at the full service management level. Forest recreationists will not have the quantity and quality of developed recreation opportunities they are likely to desire.

The Forest has a large resource of dispersed recreation opportunities not available in the private sector. Approximately 14% of the Forest is managed for semi-primitive non-motorized recreation. Dispersed recreation quality could decrease. Trail management is not emphasized. Trails, trailheads, and other improvements will not be constructed or reconstructed to help disperse recreationists. Fifteen miles of trail will be constructed or reconstructed annually over the planning horizon.

Wilderness - Wilderness management will emphasize primitive wilderness settings. None of Fossil Ridge Wilderness Study Area or Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System. The Forest's wilderness area will remain at 501,777 acres.

Fish and Wildlife - National Forest System winter range carrying capacity will increase 6% over current levels in the first decade. This is due to the aspen habitat management and increased prescribed burning programs. Annual aspen treatment will be maintained at 500 acres over the planning horizon. Prescribed burning is scheduled for 5,500 acres annually after 1985. The alternative provides 620,600 acres to be managed for wildlife habitat emphasis.

Range - The alternative schedules the permitted livestock program to increase 4%, to 333,300 AUM's grazed annually over the planning horizon. Range condition will be good with a stable trend. Grazing capacity is increased by increasing investments in structural and non-structural range improvements.

Timber - The programmed sales offered will be maintained at 28 million board feet annually during the first decade. Timber sales offered will increase to 39.9 million board feet annually over the planning horizon. The alternative will meet demand for firewood through 1990 providing 9.0 million board feet annually.

Water - This alternative will increase water yields through the first ten years by 7,710 acre feet per year over the current situation. This will be accomplished through vegetation treatment. By the fifth decade water yield will increase by 14,832 acre feet per year or .5% over the current situation.

Minerals - Table II-7 summarizes land available for mineral leasing for Alternative 2. One hundred percent of the wilderness acreage is recommended not available for leasing.

TABLE II-7.

MINERAL LEASING SUMMARY  
(Alternative 2)

Area	Leasing Availability Recommendation	Acres
Wilderness	No Lease	453,618
	Lease with Surface Occupancy	0
	Lease without Surface Occupancy	0
Unclassified	No Lease	171,830
	Lease with Surface Occupancy	2,011,370
	Lease without Surface Occupancy	188,819
Cannibal Plateau Further Plan- ning Area	No Lease	31,990
Fossil Ridge Wilderness Study Area	No Lease	47,400

Facilities - The Forest's transportation system is directly affected by management area direction. Construction or reconstruction in the alternative will occur on 49 miles of arterial roads, 38 miles of collector roads, and 185 miles of local roads during the first ten years. Nine bridges will be constructed or reconstructed during the first ten years.

#### ALTERNATIVE 3 - (1980 RPA PROGRAM)

The RPA alternative emphasizes intensive management for market output opportunities. The Forest will provide outputs to meet its share of local, regional, and national demand for goods and services. The outputs are reflected in the 1980 RPA goals and objectives tentatively assigned to the Forest in the Regional Guide. The alternative will meet the increased demand for developed recreation over the planning horizon. Demand for dispersed recreation outside the wilderness is met. No acres of Cannibal Plateau Further Planning Area or Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Range, timber, and water exceed their current output levels. Vegetation treatment would occur on approximately 16,500 acres per year during the alternative's first ten years. Outputs for each alternative are compared in Chapter IV with the tentative outputs and activities assigned to the Forest by the Regional Guide.

The goals and objectives of this alternative are:

- Manage vegetation in an economically efficient manner to provide and maintain a healthy, vigorous environment capable of producing a range of multiple-use outputs and conditions; i.e., outdoor recreation, fish and wildlife habitat, livestock grazing, visual quality, water, wood fiber, research, cultural opportunities, and economic benefits to society.
- Meet 100% of the increased demand above existing capacity for developed recreation opportunities over the planning horizon.
- Meet demand for motorized and non-motorized dispersed recreation opportunities outside wilderness areas.
- Do not disperse recreationists by constructing or reconstructing trails, trailheads, and other improvements.
- Manage 20% of wilderness acres at full service and 80% at reduced service management level.
- No acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System.
- No acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System.
- Increase winter range carrying capacity for elk and deer.
- Improve wildlife habitat diversity.

- Schedule a 6% increase in permitted livestock grazing.
- Increase investments in structural and non-structural range improvements.
- Increase programmed timber sales offered.
- Meet the demand for firewood.
- Increase water supply, while reducing soil erosion and stream turbidity.

Table II-8 displays the unique constraints in this alternative.

TABLE II-8.

CONSTRAINTS  
(Alternative 3)

Output	Type of Constraint*	Con- straint	Units**	Decade
<b>TIMBER</b>				
Total Volume	GE	81.6	MMCF/Decade	1
		40.8	MMBF/Yr	
	GE	88.4	MMCF/Decade	2
		44.2	MMBF/Yr	
	GE	90.0	MMCF/Decade	3
		45.0	MMBF/Yr	
Aspen Volume	LE	10.0	MMCF/Decade	1-5
		5.0	MMBF/Yr	
Sawtimber Volume	GE	61.4	MMCF/Decade	1
		30.7	MMBF/Yr	
	GE	66.3	MMCF/Decade	2
		33.1	MMBF/Yr	
	GE	67.5	MMCF/Decade	3-5
		33.7	MMBF/Yr	
Spruce-Fir Volume	LE	63.0	MMCF/Decade	1-5
		31.5	MMBF/Yr	
<b>Acres Clearcut</b>				
<b>Spruce-Fir and</b>				
Ponderosa Pine	LE	2,000.0	Acres/Decade	1-5
Lodgepole Pine	LE	5,500.0	Acres/Decade	1-2
	LE	4,500.0	Acres/Decade	3-5
Total Clearcut	LE	13,500.0	Acres/Decade	1-5
<b>Volume Allowed Full</b>				
<b>Road Analysis Area</b>				
	LE	9.0	MMCF/Decade	1-5
		4.5	MMBF/Yr	
<b>Volume Allowed High</b>				
<b>Road Analysis Area</b>				
	LE	13.5	MMCF/Decade	1-5
		6.7	MMBF/Yr	
<b>RANGE</b>				
Livestock Grazing	GE	3,200.0	MAUM/Decade	1-2
	GE	3,360.0	MAUM/Decade	3
	GE	3,400.0	MAUM/Decade	4-5
	LE	3,400.0	MAUM/Decade	1-3
	LE	3,740.0	MAUM/Decade	4-5

TABLE II-8. (Cont.)

Output	Type of Constraint*	Con- straint	Units**	Decade
WILDLIFE				
Aspen Habitat Improvement	LE	8,300.0	Acres/Decade	1-5
	GE	5,000.0*	Acres/Decade	1-5
Prescribed Burning	LE	55,000.0	Acres/Decade	1-5
	GE	45,000.0	Acres/Decade	1-5

\* LE = Less Than or Equal To  
 GE = Greater Than or Equal To  
 EQ = Equal To

\*\*MMCF/Decade = Million Cubic Feet/Decade  
 MMBF/YR = Million Board Feet/Year  
 MAUM/Decade = Thousand Animal Unit Months/Decade

Each constraint was analyzed by the Forest management team and interdisciplinary team.

The greater than constraint reflects the timber program defined for the Forest in the Regional Guide\*. No less than constraint was necessary. Aspen and spruce-fir volume are less than constraints which are proportional to the current timber program. Clearcut acres are proportional to the current timber management program. Total timber volume includes all timber 7 inches in diameter and greater from suitable timber land.

Upper limit constraints were placed on the amount of volume that could be harvested from fully and highly roaded analysis areas. These constraints reflect timber harvested through 1981.

The constraints ensure livestock forage production at levels sufficient to meet 1980 RPA goals for the Forest.

The greater than aspen habitat improvement constraint reflects the 1981 output level. The lower limit prescribed burning constraint reflects the projected 1982 level.

#### Expected Future Condition

Recreation - The Forest will meet 100% of the increased demand for developed recreation over the planning horizon. Fifty camping units are constructed by 1990 and an additional 50 are constructed by 1995. Approximately 45% of the sites will be operated at the full service management level.

Source: \* Rocky Mountain Regional Guide, April 1983.

Approximately 16% of the Forest is managed for semi-primitive non-motorized recreation. Dispersed recreation quality could decrease. Trail maintenance is not emphasized. Trails, trailheads, and other improvements will not be constructed or reconstructed to help disperse recreationists. Eleven miles will be constructed or reconstructed annually over the planning horizon.

Wilderness - Wilderness management will emphasize primitive wilderness settings. None of Fossil Ridge Wilderness Study Area or Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System. The Forest's wilderness area will remain at 501,777 acres.

Fish and Wildlife - National Forest System winter range carrying capacity will increase by 7% over current levels in the first decade. This is due to the aspen habitat management and increased prescribed burning programs. Annual quantity of aspen treatment will be increased from 500 to 830 acres by the year 2000. Prescribed burning is scheduled for 5,500 acres annually after 1985. The alternative provides 591,544 acres to be managed for wildlife habitat emphasis.

Range - The alternative schedules the permitted livestock program to increase by 6%, to 340,100 AUM's grazed annually over the planning horizon. Range condition will be fair to good with a stable trend. Grazing capacity is increased by increasing investments in structural and non-structural range improvements.

Timber - The programmed sales offered will increase to 40.8 million board feet annually during the first decade. Sales offered will increase to 48.8 million board feet annually over the planning horizon. The alternative will meet the demand for firewood through 1990 providing 14.1 million board feet annually.

Water - The alternative will increase water yields over the first ten years by 11,797 acre feet per year over the current situation. This will be accomplished through vegetation treatment. By the fifth decade water yield will increase by 19,238 acre feet per year or .7% over the current situation.

Minerals - Table II-9 summarizes land available for mineral leasing for Alternative 3. Sixty-two percent of the wilderness acreage is recommended not available for leasing.

TABLE II-9.

MINERAL LEASING SUMMARY  
(Alternative 3)

Area	Leasing Availability Recommendation	Acres
Wilderness	No Lease	283,513
	Lease with Surface Occupancy	70,768
	Lease without Surface Occupancy	99,337
Unclassified	No Lease	184,515
	Lease with Surface Occupancy	2,066,692
	Lease without Surface Occupancy	200,202

Facilities - The Forest's transportation system is directly affected by management area direction. Construction or reconstruction in the alternative will occur on 57 miles of arterial roads, 44 miles of collector roads, and 216 miles of local roads during the first ten years. Fifteen bridges will be constructed or reconstructed during the first ten years.

ALTERNATIVE 4 - (NON-MARKET OPPORTUNITIES)

This alternative emphasizes non-market output opportunities. Market output levels are designed to complement non-market opportunities. The increased demand for developed recreation is met over the planning horizon. The demand for dispersed recreation opportunities outside wilderness areas is met. Trail management is emphasized. Trails, trailheads, and other improvements are constructed or reconstructed to help disperse recreationists. In this Alternative 31,990 acres of Cannibal Plateau Further Planning Area and 47,400 acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. The alternative schedules wildlife habitat improvement. Permitted livestock grazing and timber harvest outputs are decreased from current levels. Vegetation treatment would occur on approximately 12,800 acres per year during the alternative's first ten years.

The goals and objectives in this alternative are:

- Manage vegetation in an economically efficient manner to provide and maintain a healthy, vigorous environment capable of producing a range of multiple-use outputs and conditions; i.e., outdoor recreation, fish and

wildlife habitat, livestock grazing, visual quality, water, wood fiber, research, cultural opportunities, and economic benefits to society.

- Meet 100% of the increased demand above existing capacity for developed recreation opportunities over the 50 year planning horizon.
- Meet demand for motorized and non-motorized dispersed recreation opportunities outside wilderness areas.
- Disperse recreationists by constructing or reconstructing trails, trail-heads, and other improvements.
- Manage 60% of wilderness acres at full service and 40% at reduced service management level.
- Thirty-one thousand nine hundred ninety acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System.
- Forty-seven thousand four hundred acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System.
- Increase winter range carrying capacity for elk and deer.
- Improve wildlife habitat diversity.
- Schedule a 3% decrease in permitted livestock grazing.
- Maintain investments in structural and non-structural range improvements.
- Decrease programmed timber sales offered.
- Do not meet the demand for firewood.
- Increase water supply, while reducing soil erosion and stream turbidity.

Table II-10 displays the unique constraints in this alternative.

TABLE II-10.

CONSTRAINTS  
(Alternative 4)

Output	Type of Constraint*	Con- straint	Units**	Decade
<b>TIMBER</b>				
Total Volume	GE	27.0	MMCF/Decade	1
		13.5	MMBF/Yr	
Aspen Volume	LE	48.0	MMCF/Decade	5
		24.0	MMBF/Yr	
Sawtimber Volume	LE	3.0	MMCF/Decade	1-5
		1.5	MMBF/Yr	
Spruce-Fir Volume	GE	20.2	MMCF/Decade	1-5
		10.1	MMBF/Yr	
Acres Clearcut	LE	16.2	MMCF/Decade	1-5
		8.1	MMBF/Yr	
Spruce-Fir	EQ	0.0	Acres/Decade	1-5
		0.0	Acres/Decade	
Ponderosa Pine	EQ	800.0	Acres/Decade	1-5
Lodgepole Pine	LE	3,200.0	Acres/Decade	1-5
Total Clearcut	LE	3,200.0	Acres/Decade	1-5
Volume Allowed Full Road Analysis Area	LE	3.4	MMCF/Decade	1-5
		1.7	MMBF/Yr	
Volume Allowed High Road Analysis Area	LE	5.1	MMCF/Decade	1-5
		2.6	MMBF/Yr	
<b>RANGE</b>				
Livestock Grazing	GE	2,900.0	MAUM/Decade	1-5
	LE	3,200.0	MAUM/Decade	1
	LE	3,100.0	MAUM/Decade	2-5
<b>WILDLIFE</b>				
Aspen Habitat	LE	20,300.0	Acres/Decade	1-5
Improvement	GE	8,300.0	Acres/Decade	1-5
Prescribed	LE	60,000.0	Acres/Decade	1-5
Burning	GE	50,000.0	Acres/Decade	1-5

\* LE = Less Than or Equal To  
 GE = Greater Than or Equal To  
 EQ = Equal To

\*\*MMCF/Decade = Million Cubic Feet/Decade  
 MMBF/YR = Million Board Feet/Year  
 MAUM/Decade = Thousand Animal Unit Months/Decade

Each constraint was analyzed by the Forest management team and interdisciplinary team.

The less than constraint was designed to reflect the goals of this alternative and to produce less timber than current management. The aspen sawtimber, spruce-fir volume, and the clearcut constraint is proportional to current management. The total timber volume constraint includes all timber 7 inches in diameter and greater from suitable timber land.

Upper limit constraints were placed on the amount of volume that could be harvested from fully and highly roaded analysis areas. These constraints reflect timber harvested through 1981.

The livestock grazing constraints reflect a 10% reduction over the current program. This is an implicit budget constraint designed to help make the alternative feasible from a budget standpoint.

A goal of this alternative is to increase National Forest System winter range carrying capacity and wildlife habitat. The constraints reflect a 60% increase in habitat management, designed to enhance wildlife habitat.

#### Expected Future Condition

Recreation - The Forest will meet 100% of the increased demand for developed recreation over the planning horizon. Fifty camping units are constructed by 1990 and an additional 50 are constructed by 1995. Approximately 58% of the sites will be operated at the full service management level.

The Forest has a large resource of dispersed recreation opportunities not available in the private sector. Approximately 14% of the Forest is managed for semi-primitive non-motorized recreation. Trail management will be emphasized, 30% of the existing Forest trail mileage will be reconstructed during the first decade (1981-1990). Fifty miles will be constructed annually over the planning horizon.

Wilderness - Wilderness management will emphasize pristine and primitive wilderness settings. Thirty-one thousand nine hundred ninety acres of Cannibal Plateau Further Planning Area and 47,400 acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. This could increase the total wilderness acres on the Forest to 581,167 acres or 20% of the total Forest.

Fish and Wildlife - National Forest System winter range carrying capacity will increase by 4% over current levels in the first decade. This is due to the aspen habitat management and increased prescribed burning programs. Annual quantity of aspen treatment will be increased from 830 to 2,030 acres by the year 2000. Prescribed burning is scheduled for 6,000 acres annually after 1985. The alternative provides 694,443 acres to be managed for wildlife habitat emphasis.

Range - The alternative schedules the permitted livestock program to decrease by 3%, to 309,900 AUM's grazed annually over the planning horizon. Range condition will be fair to good with a stable trend.

Timber - The programmed sales offered will decrease to 13.5 million board feet annually during the first decade. Programmed sales offered will increase to 21.0 million board feet annually over the planning horizon. The alternative will not meet the demand for firewood through 1990 providing 4.3 million board feet annually.

Water - The alternative will increase water yields over the first ten years by 6,981 acre feet per year over the current situation. This will be accomplished through vegetation treatment. By the fifth decade water yield will increase by 13,998 acre feet per year or .5% over the current situation.

Minerals - Table II-11 summarizes land available for mineral leasing for Alternative 4. Fifty-four percent of the wilderness acreage is recommended not available for leasing.

TABLE II-11.

MINERAL LEASING SUMMARY  
(Alternative 4)

Area	Leasing Availability Recommendation	Acres
Wilderness*	No Lease	287,275
	Lease with Surface Occupancy	129,633
	Lease without Surface Occupancy	116,110
Unclassified	No Lease	178,526
	Lease with Surface Occupancy	1,998,995
	Lease without Surface Occupancy	194,498

\* Includes the area identified suitable for inclusion in the National Wilderness Preservation System for Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area.

Facilities - The Forest's transportation system is directly affected by management area direction. Construction or reconstruction in the alternative will occur on 11 miles of arterial roads, 9 miles of collector roads, and 43 miles of local roads during the first ten years. Five bridges will be constructed or reconstructed during the first ten years.

## ALTERNATIVE 5 - (MARKET OPPORTUNITIES)

This alternative emphasizes intensive management for market output opportunities. Market outputs provide the opportunity to maintain or enhance the stability of industries needed to produce local and regional goods and services. Range, timber, and water exceed their current output levels. The increased demand above existing capacity for developed recreation is not met. This allows the private sector to meet part of the demand for developed recreation opportunities. The alternative schedules dispersed recreation opportunities and wildlife habitat improvement. No acres of Cannibal Plateau Further Planning Area or Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Permitted livestock grazing increases by 9%. Programmed timber sales offered equals 35 million board feet in the first ten years. Vegetation treatment would occur on approximately 16,100 acres per year during the alternative's first ten years.

The goals and objectives of this alternative are:

- Manage vegetation in an economically efficient manner to provide and maintain a healthy, vigorous environment capable of producing a range of multiple-use outputs and conditions; i.e., outdoor recreation, fish and wildlife habitat, livestock grazing, visual quality, water, wood fiber research, cultural opportunities, and economic benefits to society.
- Maintain developed recreation capacity at current level.
- Meet demand for dispersed motorized and non-motorized recreation opportunities outside wilderness areas.
- Do not disperse recreationists by constructing or reconstructing trails, trailheads, and other improvements.
- Manage 20% of wilderness acres at full service and 80% at reduced service management level.
- No acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System.
- No acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System.
- Increase winter range carrying capacity for elk and deer.
- Improve wildlife habitat diversity.
- Schedule a 9% increase in permitted livestock grazing.
- Increase investments in structural and non-structural range improvements.
- Increase programmed timber sales offered.
- Meet the demand for firewood.
- Increase water supply, while reducing soil erosion and stream turbidity.

Table II-12 displays the unique constraints in this alternative.

TABLE II-12.

CONSTRAINTS  
(Alternative 5)

Output	Type of Constraint*	Con- straint	Units**	Decade
<b>TIMBER</b>				
Total Volume	GE	70.0	MMCF/Decade	1
		35.0	MMBF/Yr	
Aspen Volume	LE	90.0	MMCF/Decade	5
		45.0	MMBF/Yr	
Sawtimber Volume	LE	7.0	MMCF/Decade	1-5
		3.5	MMBF/Yr	
Spruce-Fir Volume	GE	52.5	MMCF/Decade	1-5
		26.3	MMBF/Yr	
Acres Clearcut	LE	52.5	MMCF/Decade	1-5
		26.3	MMBF/Yr	
Spruce-Fir and Ponderosa Pine	LE	1,000.0	Acres/Decade	1-5
		3,000.0	Acres/Decade	
Lodgepole Pine Total Clearcut	LE	8,000.0	Acres/Decade	1-5
Volume Allowed Full Road Analysis Area	LE	9.0	MMCF/Decade	1-5
		4.5	MMBF/Yr	
Volume Allowed High Road Analysis Area	LE	13.5	MMCF/Decade	1-5
		6.8	MMBF/Yr	
<b>RANGE</b>				
Livestock Grazing	GE	3,200.0	MAUM/Decade	1
		3,340.0	MAUM/Decade	2-5
		3,500.0	MAUM/Decade	1-5
<b>WILDLIFE</b>				
Aspen Habitat Improvement	LE	8,300.0	Acres/Decade	1-5
		5,000.0	Acres/Decade	
Prescribed Burning	LE	40,000.0	Acres/Decade	1-5
		30,000.0	Acres/Decade	

\* LE = Less Than or Equal To  
 GE = Greater Than or Equal To  
 EQ = Equal To

\*\*MMCF/Decade = Million Cubic Feet/Decade  
 MMBF/YR = Million Board Feet/Year  
 MAUM/Decade = Thousand Animal Unit Months/Decade

Each constraint was analyzed by the Forest management team and interdisciplinary team.

The greater than constraint reflects the current long-term sustained yield calculation for the Forest. It is intended to increase the timber output up to that level. The aspen volume constraint assumes an expansion in the market for aspen products of 1.5 MMBF/ year. The total sawtimber volume constraint will schedule other forest products to be harvested and will enhance age class distribution. The spruce-fir volume constraint will require other timber species to be harvested. This assumes a continuation in the demand for these other species. The clearcut acre constraint is proportional to the current clearcut acres to timber volume ratio. The total volume includes all timber 7 inches in diameter and greater from suitable timber land.

Upper limit constraints were placed on the amount of volume that could be harvested from fully and highly roaded analysis areas. These constraints reflect timber harvested through 1981.

The livestock grazing constraints reflect a 9% increase over the current program. This is an implicit budget constraint designed to help make the alternative feasible from a budget standpoint.

A goal of this alternative is to increase National Forest System winter range carrying capacity and wildlife habitat in general. The constraints reflect a 30% increase in habitat management, designed to enhance wildlife habitat.

#### Expected Future Condition

Recreation - The Forest will not meet increased demand for developed recreation opportunities. Demand will not be met after 1990. Developed recreation capacity will remain at its 1981 level, 744,000 RVD's annually. This provides the private sector the opportunity to supply developed recreation opportunities to meet demand. Approximately 31% of the sites will be operated at the full service management level.

The Forest has a large resource of dispersed recreation opportunities not available in the private sector. Approximately 15% of the Forest is managed for semi-primitive non-motorized recreation. Dispersed recreation quality could decrease. Trail management is not emphasized. Trails, trailheads, and other improvements will not be constructed or reconstructed to help disperse recreationists. Fifteen miles of trail will be constructed or reconstructed annually over the planning horizon.

Wilderness - Wilderness management will emphasize primitive wilderness settings. None of Fossil Ridge Wilderness Study Area or Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System. The Forest's wilderness area will remain at 501,777 acres.

Fish and Wildlife - National Forest System winter range carrying capacity will increase by 6% over current levels in the first decade. This is due to the aspen habitat management and increased prescribed burning programs. Annual quantity of aspen treatment will be increased from 500 to 830 acres by

the year 2000. Prescribed burning is scheduled for 4,000 acres annually after 1985. The alternative provides 532,506 acres to be managed for wildlife habitat emphasis.

Range - The alternative schedules the permitted livestock program to increase by 9%, to 349,800 AUM's grazed annually over the planning horizon. Range condition will be good with a stable trend. Grazing capacity is increased by increasing investments in structural and non-structural range improvements.

Timber - The programmed sales offered will increase to 35 million board feet annually during the first decade. Programmed sales offered will increase to 40.1 million board feet annually over the planning horizon. The alternative will meet the demand for firewood through 1990 providing 11.2 million board feet annually.

Water - The alternative will increase water yields over the first ten years by 10,794 acre feet per year over the current situation. This will be accomplished through vegetation treatment. By the fifth decade water yield will increase by 18,847 acre feet per year or .7% over the current situation.

Minerals - Table II-13 summarizes land available for mineral leasing for Alternative 5. Sixty-two percent of the wilderness acreage is recommended not available for leasing.

TABLE II-13.

MINERAL LEASING SUMMARY  
(Alternative 5)

Area	Leasing Availability Recommendation	Acres
Wilderness	No Lease	283,513
	Lease with Surface Occupancy	70,768
	Lease without Surface Occupancy	99,337
Unclassified	No Lease	186,112
	Lease with Surface Occupancy	2,053,245
	Lease without Surface Occupancy	212,052

Facilities - The Forest's transportation system is directly affected by management area direction. Construction or reconstruction in the alternative will occur on 58 miles of arterial roads, 45 miles of collector roads, and 219 miles of local roads during the first ten years. Fifteen bridges will be constructed or reconstructed during the first ten years.

#### ALTERNATIVE 6

This alternative emphasizes non-market outputs. Market output levels are designed to complement non-market opportunities. The alternative will meet 79% of the total developed recreation demand at the end of the 50-year planning horizon. This allows the private sector to meet part of the demand for developed recreation opportunities. The demand for dispersed recreation opportunities outside of wilderness areas is met. Trail management will be emphasized. Trails, trailheads, and other improvements are constructed or reconstructed to help disperse recreationists. In this alternative 13,599 acres of Cannibal Plateau Further Planning Area and 34,300 acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. It schedules wildlife habitat improvement. Permitted livestock grazing and timber harvest outputs are decreased from current levels. Vegetation treatment would occur on approximately 12,700 acres per year during the alternative's first ten years.

The goals and objectives of this alternative are:

- Manage vegetation in an economically efficient manner to provide and maintain a healthy, vigorous environment capable of producing a range of multiple-use outputs and conditions; i.e., outdoor recreation, fish and wildlife habitat, livestock grazing, visual quality, water, wood fiber, research, cultural opportunities, and economic benefits to society.
- Meet 50% of increased demand above existing capacity for developed recreation opportunities at the close of the 50-year planning horizon.
- Meet demand for motorized and non-motorized dispersed recreation opportunities outside wilderness areas.
- Disperse recreationists by constructing or reconstructing trails, trailheads, and other improvements.
- Manage 60% of wilderness acres at full service and 40% at reduced service management level.
- Thirteen thousand five hundred ninety-nine acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System.
- Thirty-four thousand three hundred acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System.
- Increase winter range carrying capacity for elk and deer.

- Improve wildlife habitat diversity.
- Schedule a 3% decrease in permitted livestock grazing.
- Maintain investments in structural and non-structural range improvements.
- Decrease programmed timber sales offered.
- Do not meet the demand for firewood.
- Increase water supply, while reducing soil erosion and stream turbidity.

Table II-14 displays the unique constraints in this alternative.

TABLE II-14.

CONSTRAINTS  
(Alternative 6)

Output	Type of Constraint*	Con- straint	Units**	Decade
<b>TIMBER</b>				
Total Volume	GE	27.0	MMCF/Decade	1
		13.5	MMBF/Yr	
Aspen Volume	LE	48.0	MMCF/Decade	5
		24.0	MMBF/Yr	
Sawtimber Volume	LE	3.0	MMCF/Decade	1-5
		1.5	MMBF/Yr	
Spruce-Fir Volume	GE	20.2	MMCF/Decade	1-5
		10.1	MMBF/Yr	
Acres Clearcut	LE	16.2	MMCF/Decade	1-5
		8.1	MMBF/Yr	
Spruce-Fir	EQ	0.0	Acres/Decade	1-5
		0.0	Acres/Decade	
Ponderosa Pine	EQ	800.0	Acres/Decade	1-5
Lodgepole Pine	LE	3,200.0	Acres/Decade	1-5
Total Clearcut	LE		Acres/Decade	1-5
Volume Allowed Full Road Analysis Area	LE	3.4	MMCF/Decade	1-5
		1.7	MMBF/Yr	
Volume Allowed High Road Analysis Area	LE	5.1	MMCF/Decade	1-5
		2.5	MMBF/Yr	
<b>RANGE</b>				
Livestock Grazing	GE	3,000.0	MAUM/Decade	1
	LE	3,200.0	MAUM/Decade	1
	LE	3,100.0	MAUM/Decade	2-5

TABLE II-14. (Cont.)

Output	Type of Constraint*	Con- straint	Units**	Decade
WILDLIFE				
Aspen Habitat Improvement	LE	20,300.0	Acres/Decade	1-5
	GE	8,300.0	Acres/Decade	1-5
Prescribed Burning	LE	60,000.0	Acres/Decade	1-5
	GE	50,000.0	Acres/Decade	1-5

\* LE = Less Than or Equal To

GE = Greater Than or Equal To

EQ = Equal To

\*\*MMCF/Decade = Million Cubic Feet/Decade

MMBF/YR = Million Board Feet/Year

MAUM/Decade = Thousand Animal Unit Months/Decade

Each constraint was analyzed by the Forest management team and interdisciplinary team.

The greater than total volume constraint was established by the Forest management team. It is an implicit budget constraint designed to help make this alternative feasible from a budget standpoint. The less than constraint was designed to reflect the goals of this alternative and to produce less timber than current management. The aspen sawtimber, spruce-fir volume, and the clearcut constraints are proportional to current management. Total timber volume includes all timber 7 inches in diameter and greater from suitable timber land.

Upper limit constraints were placed on the amount of volume that could be harvested from fully and highly roaded analysis areas. These constraints reflect timber harvested through 1981.

The livestock grazing constraints reflect a 10% reduction over the current program. This is an implicit budget constraint designed to help make the alternative feasible from a budget standpoint.

A goal of this alternative is to increase National Forest System winter range carrying capacity and wildlife habitat in general. The constraints reflect a 60% increase in habitat management, designed to enhance wildlife habitat.

#### Expected Future Condition

Recreation - The demand for developed recreation opportunities will increase from 617,000 RVD's in 1985 to 1,280,000 RVD's annually by the year 2030. The

Forest will reduce the percentage of total demand met over the 50-year planning horizon from 100% in decade 1 to 96, 89, 82, and 79% in decades 2 through 5. Total developed recreation capacity will increase from 744,000 RVD's annually in decade 1 to 1,012,000 RVD's annually in decade 5. Approximately 42% of the sites will be operated at the full service management level.

The Forest has a large resource of dispersed recreation opportunities not available in the private sector. Approximately 14% of the Forest is managed for semi-primitive non-motorized recreation. Trail management will be emphasized, 30% of the existing Forest trail mileage will be reconstructed during the first decade. Fifty miles of trail will be constructed or reconstructed annually over the planning horizon.

Wilderness - Wilderness management will emphasize primitive wilderness settings. Thirteen thousand five hundred ninety-nine acres of Cannibal Plateau Further Planning Area and 34,300 acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. This could increase the total wilderness acres on the Forest to 549,676 acres or 19% of the total Forest acres.

Fish and Wildlife - National Forest System winter range carrying capacity will increase by 5% over current levels in the first decade. This is due to the aspen habitat management and increased prescribed burning programs. Annual quantity of aspen treatment will be increased from 830 to 2,030 acres by the year 2000. Prescribed burning is scheduled for 6,000 acres annually after 1985. The alternative provides 703,176 acres to be managed for wildlife habitat emphasis.

Range - The alternative schedules the permitted livestock program to decrease by 3%, to 309,900 AUM's grazed annually over the planning horizon. Range condition will be fair to good with a stable trend.

Timber - The programmed sales offered will decrease to 13.5 million board feet annually during the first decade. Programmed sales offered will increase to 17.6 million board feet annually over the planning horizon. The alternative will not meet the demand for firewood through 1990 providing 4.3 million board feet annually.

Water - The alternative will increase water yields over the first ten years by 6,841 acre feet per year over the current situation. This will be accomplished through vegetation treatment. By the fifth decade water yield will increase by 13,718 acre feet per year or .5% over the current situation.

Minerals - Table II-15 summarizes land available for mineral leasing for Alternative 6. Fifty-seven percent of the wilderness acreage is recommended not available for leasing.

TABLE II-15.

MINERAL LEASING SUMMARY  
(Alternative 6)

Area	Leasing Availability Recommendation	Acres
Wilderness*	No Lease	285,992
	Lease with Surface Occupancy	105,230
	Lease without Surface Occupancy	110,295
Unclassified	No Lease	178,231
	Lease with Surface Occupancy	2,032,839
	Lease without Surface Occupancy	192,440

\* Includes the area identified suitable for inclusion in the National Wilderness Preservation System for Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area.

Facilities - The Forest's transportation system is directly affected by management area direction. Construction or reconstruction in the alternative will occur on 11 miles of arterial roads, 9 miles of collector roads, and 43 miles of local roads during the first ten years. Five bridges will be constructed or reconstructed during the first ten years.

#### ALTERNATIVE 7

The alternative emphasizes intensive management for market outputs. Market outputs provide the opportunity to maintain the stability of industries needed to produce local and regional goods and services. Range, timber, and water exceed their current output levels. The increased demand above existing capacity for developed recreation opportunities is not met. The alternative schedules dispersed recreation opportunities and wildlife habitat improvement. In this alternative 31,990 acres of Cannibal Plateau Further Planning Area and 47,400 acres of Fossil Ridge Wilderness Study Area suitable for inclusion in the National Wilderness Preservation System. Permitted livestock grazing increases by 9%. Programmed timber sales offered equals 30 million board feet in the first ten years. Vegetation treatment would occur on approximately 15,700 acres per year during the alternative's first ten years.

The goals and objectives of this alternative are:

- Manage vegetation in an economically efficient manner to provide and maintain a healthy, vigorous environment capable of producing a range of multiple-use outputs and conditions; i.e., outdoor recreation, fish and wildlife habitat, livestock grazing, visual quality, water, wood fiber, research, cultural opportunities, and economic benefits to society.
- Maintain developed recreation capacity at current level.
- Meet demand for motorized and non-motorized dispersed recreation opportunities outside wilderness areas.
- Do not disperse recreationists by constructing or reconstructing trails, trailheads, and other improvements.
- Manage 60% of wilderness acres at full service and 40% at reduced service management level.
- Thirty-one thousand nine hundred ninety acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System.
- Forty-seven thousand four hundred acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System.
- Increase winter range carrying capacity for elk and deer.
- Improve wildlife habitat diversity.
- Schedule a 9% increase in permitted livestock grazing.
- Increase investments in structural and non-structural range improvements.
- Increase programmed timber sales offered.
- Meet the demand for firewood.
- Increase water supply, while reducing soil erosion and stream turbidity.

Table II-16 displays the unique constraints in this alternative.

TABLE II-16.

CONSTRAINTS  
(Alternative 7)

Output	Type of Constraint*	Con- straint	Units**	Decade
<b>TIMBER</b>				
Total Volume	GE	60.0	MMCF/Decade	1
		30.0	MMBF/Yr	
Aspen Volume	LE	70.0	MMCF/Decade	5
		35.0	MMBF/Yr	
		6.0	MMCF/Decade	
Sawtimber Volume	GE	45.0	MMCF/Decade	1-5
		22.5	MMBF/Yr	
Spruce-Fir Volume	LE	39.0	MMCF/Decade	1-5
		19.5	MMBF/Yr	
<b>Acres Clearcut</b>				
Spruce-Fir	EQ	0.0	Acres/Decade	1-5
Ponderosa Pine	EQ	0.0	Acres/Decade	1-5
Lodgepole Pine	LE	2,400.0	Acres/Decade	1
	LE	2,700.0	Acres/Decade	3-5
Total Clearcut	LE	7,000.0	Acres/Decade	1-5
<b>Volume Allowed Full Road Analysis Area</b>				
	LE	7.0	MMCF/Decade	1-5
		3.5	MMBF/Yr	
<b>Volume Allowed High Road Analysis Area</b>				
	LE	10.5	MMCF/Decade	1-5
		5.2	MMBF/Yr	
<b>RANGE</b>				
Livestock Grazing	GE	3,200.0	MAUM/Decade	1
	GE	3,340.0	MAUM/Decade	2-5
	LE	3,500.0	MAUM/Decade	1-5
<b>WILDLIFE</b>				
Aspen Habitat	LE	20,300.0	Acres/Decade	1-5
Improvement	GE	8,300.0	Acres/Decade	1-5
Prescribed Burning	LE	40,000.0	Acres/Decade	1-5

\* LE = Less Than or Equal To  
 GE = Greater Than or Equal To  
 EQ = Equal To

\*\*MMCF/Decade = Million Cubic Feet/Decade  
 MMBF/YR = Million Board Feet/Year  
 MAUM/Decade = Thousand Animal Unit Months/Decade

Each constraint was analyzed by the Forest management team and interdisciplinary team.

The constraints reflect the current long-term sustained yield calculation for the Forest. This alternative is designed to increase the timber output up to that level. The less than timber constraints are implicit budget constraints designed to help make this alternative feasible from a budget stand point. The aspen volume constraint assures no expansion in the market for aspen products. The sawtimber volume constraint will schedule other forest products to be harvested and will enhance age class distribution. The spruce-fir volume constraint will require other timber species to be harvested. This assures a continuation in the demand for these other species. The clearcut acre constraint is proportional to the current clearcut acres timber volume ratio. Total volume includes all timber 7 inches in diameter and greater for suitable timber land.

Upper limit constraints were placed on the amount of volume that could be harvested from fully and highly roaded analysis areas. These constraints reflect timber harvested through 1981.

The livestock grazing constraint reflects a maximum 9% increase over the current program. This is an implicit budget constraint designed to help make the alternative feasible from a budget standpoint.

A goal of this alternative is to increase National Forest System winter range carrying capacity and wildlife habitat in general. The constraints reflect a 60% increase in habitat management, designed to enhance wildlife habitat.

#### Expected Future Condition

Recreation - The Forest will not meet increased demand for developed recreation opportunities. Demand will not be met after 1990. Developed recreation capacity will remain at its 1981 level of 744,000 RVD's annually. This provides the private sector the opportunity to supply developed recreation opportunities to meet demand. Approximately 31% of the sites will be operated at the full service management level.

The Forest has a large resource of dispersed recreation opportunities not available in the private sector. Approximately 14% of the Forest is managed for semi-primitive non-motorized recreation. Dispersed recreation quality could decrease. Trail management is not emphasized. Trails, trailheads, and other improvements will not be constructed or reconstructed to help disperse recreationists. Fifteen miles of trail will be constructed or reconstructed annually over the planning horizon.

Wilderness - Wilderness management will emphasize pristine and primitive wilderness settings. Thirty-one thousand nine hundred ninety acres of Cannibal Plateau Further Planning Area and 47,400 acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. This could increase the total wilderness acres on the Forest to 581,167 acres or 20% of the total Forest.

Fish and Wildlife - National Forest System winter range carrying capacity will increase by 4% over current levels in the first decade. This is due to the aspen habitat management and increased prescribed burning programs. Annual quantity of aspen treatment will be maintained at 830 acres over the planning horizon. Prescribed burning is scheduled for 4,000 acres annually after 1985. The alternative provides 538,624 acres to be managed for wildlife habitat emphasis.

Range - The alternative schedules the permitted livestock program to increase by 9%, to 349,900 AUM's grazed annually over the planning horizon. Range condition will be good with a stable trend. Grazing is increased by increasing investments in structural and non-structural range improvement.

Timber - The programmed sales offered will increase to 30 million board feet annually during the first decade. Programmed sales offered will increase to 35.0 million board feet annually over the planning horizon. The alternative will meet the demand for firewood through 1990 providing 9.6 million board feet annually.

Water - The alternative will increase water yields over the first ten years by 9,893 acre feet per year over the current situation. This will be accomplished through vegetation treatment. By the fifth decade water yield will increase by 16,732 acre feet per year or .6% over the current situation.

Minerals - Table II-17 summarizes land available for mineral leasing for Alternative 7. Fifty-four percent of the wilderness acreage is recommended not available for leasing.

TABLE II-17.

MINERAL LEASING SUMMARY  
(Alternative 7)

Area	Leasing Availability Recommendation	Acres
Wilderness*	No Lease	287,275
	Lease with Surface Occupancy	129,633
	Lease without Surface Occupancy	116,100
Unclassified	No Lease	173,158
	Lease with Surface Occupancy	1,989,722
	Lease without Surface Occupancy	209,139

\* Includes the area identified suitable for inclusion in the National Wilderness Preservation System for Cannibal Plateau Further Planning Area and Fossil Ridge Wilderness Study Area.

Facilities - The Forest's transportation system is directly affected by management area direction. Construction or reconstruction in the alternative will occur on 47 miles of arterial roads, 36 miles of collector roads, and 176 miles of local roads during the first ten years. Twelve bridges will be constructed or reconstructed during the first ten years.

#### ALTERNATIVE 8

This alternative is designed to augment water yield. This alternative emphasizes intensive management for market outputs. It emphasizes water production through vegetation treatment. Timber resources are managed intensively and silvicultural treatments are designed to enhance water runoff. Permitted livestock grazing will increase by 5%. The alternative will meet 79% of total developed recreation demand at the end of the 50-year planning horizon. This allows the private sector to meet part of the demand for developed recreation opportunities. The alternative schedules dispersed recreation opportunities and wildlife habitat improvement. Trail management will not be emphasized. In this alternative 13,599 acres of Cannibal Plateau Further Planning Area and no acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Vegetation treatment would occur on approximately 17,100 acres per year during the alternative's first ten years.

The goals and objectives of this alternative are:

- Manage vegetation in an economically efficient manner to provide and maintain a healthy, vigorous environment capable of producing a range of multiple-use outputs and conditions; i.e., outdoor recreation, fish and wildlife habitat, livestock grazing, visual quality, water, wood fiber, research, cultural opportunities, and economic benefits to society.
- Meet 50% of increased demand above existing capacity for developed recreation opportunities at the close of the 50-year planning horizon.
- Meet demand for motorized and non-motorized dispersed recreation opportunities outside wilderness areas.
- Do not disperse recreationists by constructing or reconstructing trails, trailheads, and other improvements.
- Manage 40% of wilderness acres at full service and 60% at reduced service management level.
- Thirteen thousand five hundred ninety-nine acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System.
- No acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System.
- Increase winter range carrying capacity for elk and deer.
- Improve wildlife habitat diversity.

- Schedule a 5% increase in permitted livestock grazing.
- Increase investments in structural and non-structural range improvements.
- Increase programmed timber sales offered.
- Meet the demand for firewood.
- Increase water supply, while reducing soil erosion and stream turbidity.

Table II-18 displays the unique constraints in this alternative.

TABLE II-18.

CONSTRAINTS  
(Alternative 8)

Output	Type of Constraint*	Con- straint	Units**	Decade
<b>TIMBER</b>				
Total Volume	GE	70.0	MMCF/Decade	1
		35.0	MMBF/Yr	
Aspen Volume	LE	75.0	MMCF/Decade	5
		37.5	MMBF/Yr	
Sawtimber Volume	LE	4.0	MMCF/Decade	1-5
		2.0	MMBF/Yr	
Spruce-Fir Volume	GE	52.5	MMCF/Decade	1-5
		26.2	MMBF/Yr	
Acres Clearcut	LE	52.5	MMCF/Decade	1-5
		26.2	MMBF/Yr	
Spruce-Fir and Ponderosa Pine	LE	1,000.0	Acres/Decade	1-5
		4,000.0	Acres/Decade	1-5
Lodgepole Pine	LE	8,000.0	Acres/Decade	1-5
Total Clearcut	LE	8,000.0	Acres/Decade	1-5
Volume Allowed Full Road Analysis Area	LE	9.0	MMCF/Decade	1-5
		4.5	MMBF/Yr	
Volume Allowed High Road Analysis Area	LE	13.5	MMCF/Decade	1-5
		6.8	MMBF/Yr	
<b>RANGE</b>				
Livestock Grazing	GE	3,200.0	MAUM/Decade	1
	GE	3,270.0	MAUM/Decade	2-5
	LE	3,370.0	MAUM/Decade	1-5

TABLE II-18. (Cont.)

CONSTRAINTS  
(Alternative 8)

Output	Type of Constraint*	Con- straint	Units**	Decade
<b>WILDLIFE</b>				
Aspen Habitat	LE	20,300.0	Acres/Decade	1-5
Improvement	GE	8,300.0	Acres/Decade	1-5
Prescribed	LE	60,000.0	Acres/Decade	1-5
Burning	GE	50,000.0	Acres/Decade	1-5

\* LE = Less Than or Equal To

GE = Greater Than or Equal To

EQ = Equal To

\*\*MMCF/Decade = Million Cubic Feet/Decade

MMBF/YR = Million Board Feet/Year

MAUM/Decade = Thousand Animal Unit Months/Decade

Each constraint was analyzed by the Forest management team and interdisciplinary team.

The greater than constraint reflects the current long-term sustained yield calculation for the Forest. It is intended to increase the timber output up to that level. The less than constraint was established by the Forest management team. It is an implicit budget constraint designed to help make this alternative feasible from a budget standpoint. The aspen volume constraint assumes no expansion in the market for aspen products. The sawtimber volume constraint will schedule other forest products to be harvested and will enhance age class distribution. The spruce-fir volume constraint will require other timber species to be harvested. This assumes a continuation in the demand for these other species. The clearcut acre constraint is increased over the current level. The goal of this alternative is water augmentation. This will be achieved in part by clearcut harvest. Total volume includes all timber 7 inches in diameter and greater for suitable timber land.

Upper limit constraints were placed on the amount of volume that could be harvested from fully and highly roaded analysis areas. These constraints reflect timber harvested through 1981.

The livestock grazing constraints reflect a 5% increase over the current program. This is an implicit budget constraint designed to help make the alternative feasible from a budget standpoint.

A goal of this alternative is to increase National Forest System winter range carrying capacity and wildlife habitat in general. The constraints reflect a 60% increase in habitat management, designed to enhance wildlife habitat.

## Expected Future Condition

Recreation - The demand for developed recreation opportunities will increase from 617,000 RVD's in 1985 to 1,280,000 RVD's annually by the year 2030. The Forest will reduce the percentage of total demand met over the 50-year planning horizon from 100% in decade 1 to 96, 89, 82, and 79% in decades 2 through 5. Total developed recreation capacity will increase from 744,000 RVD's annually in decade 1 to 1,012,000 RVD's annually in decade 5. Approximately 58% of the sites will be operated at the full service management level.

The Forest has a large resource of dispersed recreation opportunities not available in the private sector. Approximately 14% of the Forest is managed for semi-primitive non-motorized recreation. Trail management will not be emphasized. Fifteen miles of trail will be constructed or reconstructed annually over the planning horizon.

Wilderness - Wilderness management will emphasize primitive wilderness settings. Thirteen thousand five hundred ninety-nine acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System. This could increase the total wilderness acres on the Forest to 515,376 acres or 17% of the total Forest acres. No acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System.

Fish and Wildlife - National Forest System winter range carrying capacity will increase by 6% over current levels in the first decade. This is due to the aspen habitat management and increased prescribed burning programs. Annual quantity of aspen treatment will be increased from 830 to 2,030 acres by the year 2010. Prescribed burning is scheduled for 4,000 acres annually after 1985. The alternative provides 657,728 acres to be managed for wildlife habitat emphasis.

Range - The alternative schedules the permitted livestock program to increase by 5%, to 336,700 AUM's grazed annually over the planning horizon. Range condition will be good with a stable trend. Grazing capacity is increased by increasing investments in structural and non-structural range improvements.

Timber - The programmed sales offered will increase to 35 million board feet annually during the first decade. Programmed sales offered will increase to 37.5 million board feet annually over the planning horizon. The alternative will meet the demand for firewood through 1990 providing 11.2 million board feet annually.

Water - The alternative will increase water yields in the first ten years by 14,260 acre feet per year over the current situation. This will be accomplished through vegetation treatment. By the fifth decade water yield will increase by 24,928 acre feet per year or .9% over the current situation.

Minerals - Table II-19 summarizes land available for mineral leasing for Alternative 8. Sixty two percent of the wilderness acreage is recommended not available for leasing.

TABLE II-19.

MINERAL LEASING  
(Alternative 8)

Area	Leasing Availability Recommendation	Acres
Wilderness*	No Lease	285,992
	Lease with Surface Occupancy	76,418
	Lease without Surface Occupancy	104,807
Unclassified	No Lease	176,216
	Lease with Surface Occupancy	2,053,385
	Lease without Surface Occupancy	208,209

\* Includes the area identified suitable for inclusion in the National Wilderness Preservation System for Cannibal Plateau Further Planning Area.

Facilities - The Forest's transportation system is directly affected by management area direction. Construction or reconstruction in the alternative will occur on 43 miles of arterial roads, 34 miles of collector roads, and 164 miles of local roads during the first ten years. Fourteen bridges will be constructed or reconstructed during the first ten years.

ALTERNATIVE 9 - (REDUCED BUDGET)

This alternative emphasizes market outputs under a 25% reduced budget when compared to fiscal year 1982. The alternative displays the level of outputs, benefits, and costs associated with a reduced budget. Developed recreation capacity is reduced below 1981 levels. Increased demand for developed recreation is not met. This allows the private sector to meet part of the demand for developed recreation opportunities. The alternative maintains dispersed recreation opportunities and wildlife habitat improvement. No acres of Cannibal Plateau Further Planning Area or Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System. Permitted livestock grazing and timber harvest outputs are decreased from current levels. Vegetation treatment would occur on approximately 9,600 acres per year during the alternative's first ten years.

The goals and objectives of this alternative are:

- Manage vegetation in an economically efficient manner to provide a range of multiple-use outputs and conditions; i.e., outdoor recreation, fish and wildlife habitat, livestock grazing, visual quality, water, wood fiber, research, cultural opportunities, and economic benefits to society.
- Reduce developed recreation opportunities below existing capacity.
- Meet demand for motorized and non-motorized dispersed recreation opportunities outside wilderness areas.
- Do not disperse recreationists by constructing or reconstructing trails, trailheads, and other improvements.
- Manage 100% of wilderness acres at reduced service management level.
- No acres of Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System.
- No acres of Fossil Ridge Wilderness Study Area are suitable for inclusion in the National Wilderness Preservation System.
- Maintain winter range carrying capacity for elk and deer.
- Maintain wildlife habitat diversity.
- Schedule a 2% decrease in permitted livestock grazing.
- Maintain investments in structural and non-structural range improvements.
- Decrease programmed timber sales offered.
- Do not meet demand for firewood.
- Increase water supply, while reducing soil erosion and stream turbidity.
- Reduce budget requirements by 25% from 1982 levels.

Table II-20 displays the unique constraints in this alternative.

TABLE II-20.

CONSTRAINTS  
(Alternative 9)

Output	Type of Constraint*	Con- straint	Units**	Decade
TIMBER				
Total Volume	GE	44.0	MMCF/Decade	1
		22.0	MMBF/Yr	
	LE	62.0	MMCF/Decade	5
		31.0	MMBF/Yr	
Aspen Volume	LE	4.0	MMCF/Decade	1-5
		2.0	MMBF/Yr	
Sawtimber Volume	GE	31.0	MMCF/Decade	1-5
		15.5	MMBF/Yr	
Spruce-Fir Volume	LE	33.6	MMCF/Decade	1-5
		16.8	MMBF/Yr	
Acres Clearcut				
Spruce-Fir	EQ	0.0	Acres/Decade	1-5
Ponderosa Pine	EQ	0.0	Acres/Decade	1-5
Lodgepole Pine	LE	1,500.0	Acres/Decade	1-5
Total Clearcut	LE	4,500.0	Acres/Decade	1-5
Volume Allowed Full Road Analysis Area	LE	7.0	MMCF/Decade	1-5
		3.5	MMBF/Yr	
Volume Allowed High Road Analysis Area	LE	10.5	MMCF/Decade	1-5
		5.2	MMBF/Yr	
RANGE				
Livestock Grazing	GE	3,150.0	MAUM/Decade	1-2
		3,250.0	MAUM/Decade	
WILDLIFE				
Aspen Habitat Improvement	LE	5,000.0	Acres/Decade	1-5
	GE	4,000.0	Acres/Decade	1-5
Prescribed Burning	LE	23,500.0	Acres/Decade	1-5
	GE	22,500.0	Acres/Decade	1-5

\* LE = Less Than or Equal To  
GE = Greater Than or Equal To  
EQ = Equal To

\*\*MMCF/Decade = Million Cubic Feet/Decade  
MMBF/YR = Million Board Feet/Year  
MAUM/Decade = Thousand Animal Unit Month/Decade

Each constraint was analyzed by the Forest management team and interdisciplinary team.

This is a reduced budget alternative. The greater than total volume constraint reflects 80% of the fiscal year 1981 programmed sales offered. This is the harvest level floor used in the benchmark analysis. The less than total volume constraint is an implicit budget constraint. It is designed to lower the overall timber costs of this alternative while still maintaining the general mix of outputs produced in 1981. The aspen, spruce-fir, and sawtimber volume and total clearcut constraints are proportional to current management. Total volume includes all timber 7 inches in diameter and greater for suitable timber land.

Upper limit constraints were placed on the amount of volume that could be harvested from fully and highly roaded analysis areas. These constraints reflect timber harvested through 1981.

The livestock grazing constraints are designed to maintain or slightly reduce range outputs. This is an implicit budget constraint.

The wildlife constraints are designed to reduce the investments for wildlife habitat management. This is an implicit budget constraint.

#### Expected Future Condition

Recreation - The Forest will not meet demand for developed recreation opportunities after 1986. Developed recreation capacity will be reduced below the 1981 level of 744,000 RVD's to 657,000 RVD's annually. Existing developed recreation sites will be managed on a shortened season. Approximately 36% of the sites will be operated at the full service management level.

Approximately 16% of the Forest is managed for semi-primitive non-motorized recreation. Dispersed recreation quality could decrease. Trail management will not be emphasized. No Forest trails will be constructed or reconstructed annually over the planning horizon.

Wilderness - Wilderness management will emphasize primitive wilderness settings. None of Fossil Ridge Wilderness Study Area or Cannibal Plateau Further Planning Area are suitable for inclusion in the National Wilderness Preservation System. The Forest's wilderness area will remain at 501,777 acres.

Fish and Wildlife - National Forest System winter range carrying capacity will increase by 4% over current levels in the first decade. This is due to the aspen habitat management and increased prescribed burning programs. Annual quantity of aspen treatment will be maintained at 500 acres over the planning horizon. Prescribed burning is scheduled for 2,250 acres annually after 1985. The alternative provides 510,383 acres to be managed for wildlife habitat emphasis.

Range - The alternative schedules the permitted livestock program to decrease by 2%, to 315,000 AUM's grazed annually over the planning horizon. Range condition will be fair to good with a stable trend.

Timber - The programmed sales offered will decrease to 22 million board feet annually during the first decade. Programmed sales offered will increase to 23.7 million board feet annually over the planning horizon. The alternative will not meet the demand for firewood through 1990 providing 7.0 million board feet annually.

Water - The alternative will increase water yields over the first ten years by 6,553 acre feet per year over the current situation. This will be accomplished through vegetation treatment. By the fifth decade water yield will increase by 12,607 acre feet per year or .4% over the current situation.

Minerals - Table II-21 summarizes land available for mineral leasing for Alternative 9. Sixty-two percent of the wilderness acreage is recommended not available for leasing.

TABLE II-21.

MINERAL LEASING SUMMARY  
(Alternative 9)

Area	Leasing Availability Recommendation	Acres
Wilderness	No Lease	283,513
	Lease with Surface Occupancy	70,768
	Lease without Surface Occupancy	99,337
Unclassified	No Lease	174,262
	Lease with Surface Occupancy	2,068,417
	Lease without Surface Occupancy	208,730

Facilities - The Forest's transportation system is directly affected by management area direction. Construction or reconstruction in the alternative will occur on 36 miles of arterial roads, 28 miles of collector roads, and 137 miles of local roads during the first ten years. Nine bridges will be constructed or reconstructed during the first ten years.

SUMMARY OF ALTERNATIVES FOR FOSSIL RIDGE WILDERNESS STUDY AREA AND CANNIBAL PLATEAU FURTHER PLANNING AREA

Nine alternatives were considered in detail in this Final EIS, Chapter II. In each alternative Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area were suitable, partially suitable, or unsuitable for inclusion in the National Wilderness Preservation System. The following is

provided for the reviewers' convenience. It will summarize alternative forms of management for Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area. The Affected Environment for Fossil Ridge and Cannibal Plateau is described in Chapter III, Wilderness. Environmental consequences for each alternative are disclosed in Chapter IV in the individual resource sections. The suitability analysis for each alternative is disclosed in Chapter IV, Wilderness. Appendix K indexes the Fossil Ridge Wilderness Study Area. Appendix L indexes the Cannibal Plateau Further Planning Area.

#### FOSSIL RIDGE WILDERNESS STUDY AREA

The Colorado Wilderness Act of 1980 (Public Law 96-560) directed the Forest Service to address the suitability or unsuitability of the Fossil Ridge Wilderness Study Area for inclusion in the National Wilderness Preservation System (NWPS). The following four alternatives are considered:

#### Alternatives Fossil Ridge Wilderness Study Area

Alternative A - This is the No Action alternative. The entire Fossil Ridge Wilderness Study Area is unsuitable for inclusion in the National Wilderness Preservation System. The Wilderness Study Area will be managed for non-market output opportunities. Figure II-2 displays the Fossil Ridge Wilderness Study Area. This alternative is part of Final EIS Alternatives 2 and 9.

This alternative manages the Fossil Ridge Wilderness Study Area with the following land management allocations: 21,687 acres in Prescription 2A with an emphasis on semi-primitive motorized recreation opportunity; 1,315 acres in Prescription 2B with an emphasis on roaded natural and rural recreation opportunity; and 24,398 acres in Prescription 3A with an emphasis on semi-primitive non-motorized recreation opportunity.

Alternative B - Thirty-four thousand three hundred acres are suitable for inclusion in the National Wilderness Preservation System. In this alternative approximately 13,100 acres of the Fossil Ridge Wilderness Study Area are unsuitable for inclusion in the National Wilderness Preservation System. Figure II-3 displays this alternative. This alternative is part of Final EIS Alternative 6.

This alternative manages the Fossil Ridge Wilderness Study Area with the following land management allocations: non-wilderness - 8,900 acres in Prescription 2A with an emphasis on semi-primitive motorized recreation opportunity; 4,200 acres in Prescription 6B with emphasis on livestock grazing; wilderness - 7,867 acres in Prescription 8A with an emphasis on pristine wilderness setting; 16,037 acres in Prescription 8B with an emphasis on primitive wilderness setting; 8,476 acres in Prescription 8C with an emphasis on semi-primitive wilderness setting; and 1,920 acres in Prescription 8D with an emphasis on high-density wilderness setting.

Alternative C - In this alternative the entire Fossil Ridge Wilderness Study Area is suitable for inclusion in the National Wilderness Preservation System. Figure II-2 displays the Fossil Ridge Wilderness Study Area. This alternative is part of Final EIS Alternatives 4 and 7.

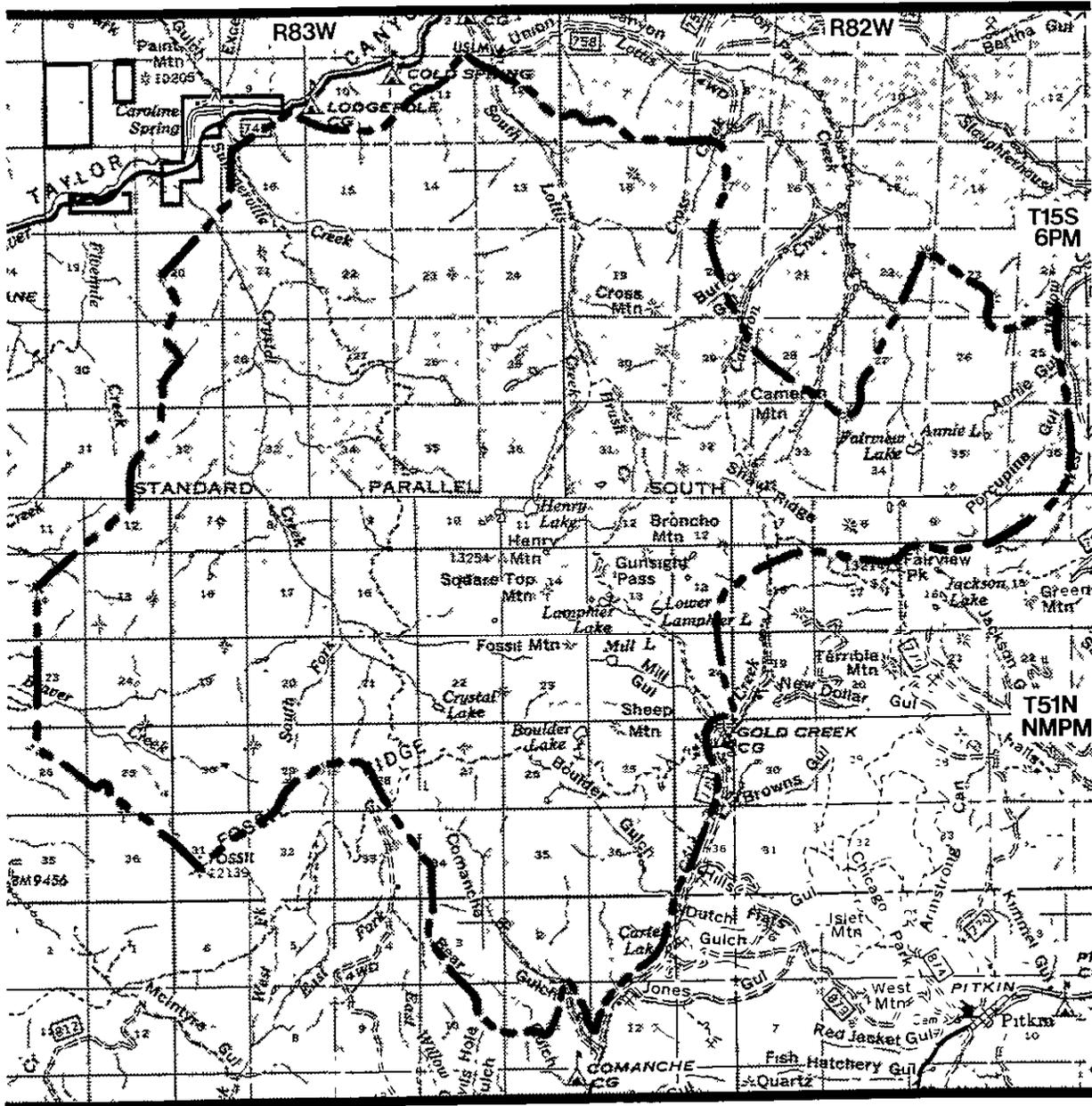
This alternative manages the Fossil Ridge WSA with the following land management allocations: 16,290 acres in Prescription 8A with an emphasis on pristine wilderness setting; 15,698 acres in Prescription 8B with an emphasis on primitive wilderness setting; 13,327 acres in Prescription 8C with an emphasis on semi-primitive wilderness setting; and 2,085 acres in Prescription 8D with an emphasis on high-density wilderness setting.

Alternative D - In this alternative the entire Fossil Ridge WSA is unsuitable for inclusion in the National Wilderness Preservation System. This alternative was added to the Final EIS to provide an opportunity to schedule outputs for the WSA because of its legislative status. The WSA will be managed for market output opportunities. Figure II-2<sup>7</sup> displays the Fossil Ridge WSA. This alternative is part of Final EIS Alternatives 1, 3, 5 and 8.

This alternative manages the Fossil Ridge WSA with the following land management allocations: 21,369 acres in Prescription 2A with an emphasis on semi-primitive motorized recreation opportunity; 1,315 acres in Prescription 2B with an emphasis on roaded natural and rural recreation opportunity; 21,116 acres in Prescription 3A with an emphasis on semi-primitive non-motorized recreation opportunity; 1,500 acres in Prescription 6B with an emphasis on livestock grazing; and 200 acres in Prescription 7A, 300 acres in Prescription 7C, and 1,600 acres in Prescription 7E with an emphasis on intensive timber management.

FIGURE II-2.

FOSSIL RIDGE WILDERNESS STUDY AREA  
(Alternative A, C, and D: 47,400 Acres)



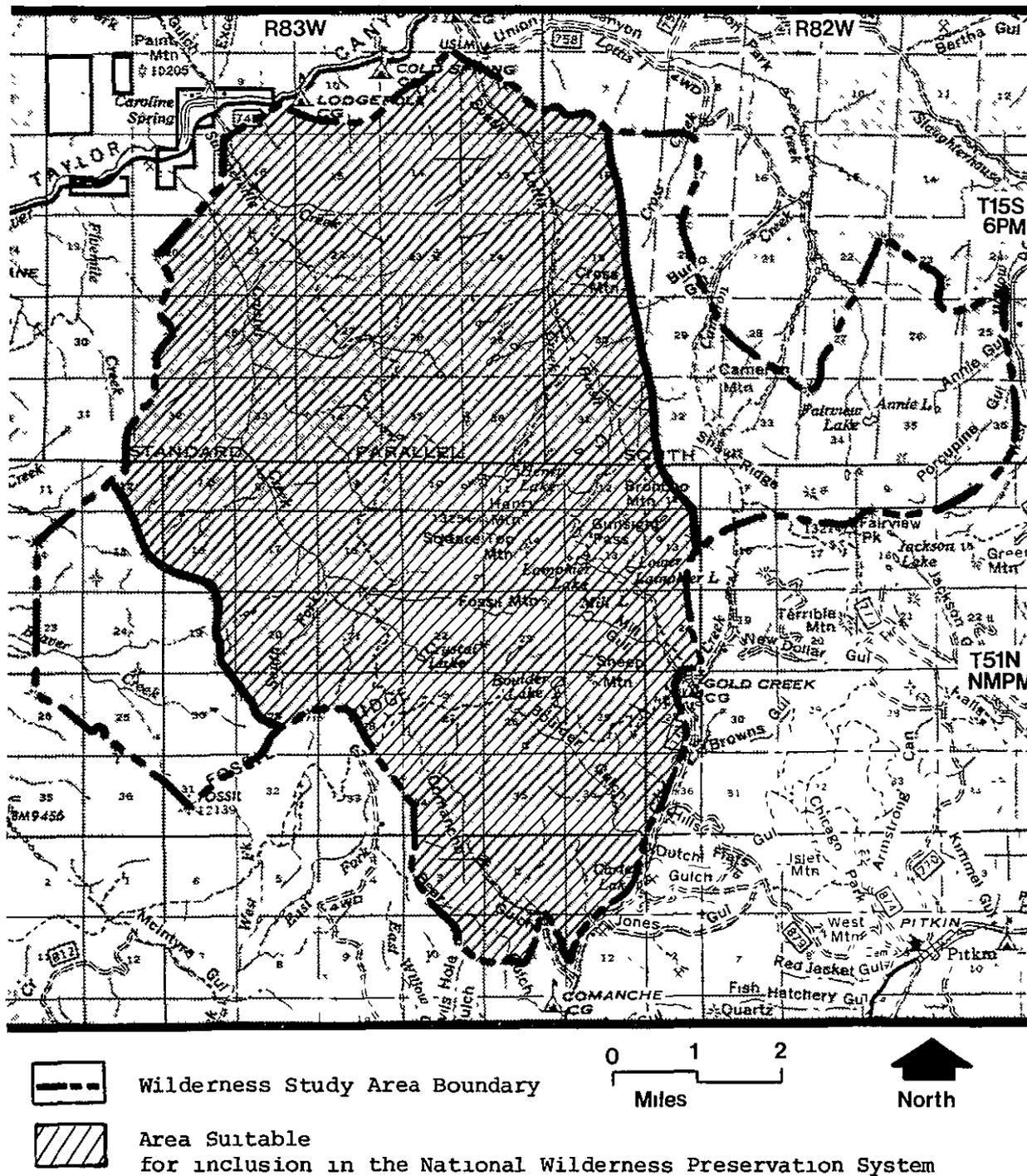
 Wilderness Study Area Boundary

0 1 2  
Miles

  
North

FIGURE II-3.

FOSSIL RIDGE WILDERNESS STUDY AREA  
 (Alternative B, 34,300 Acres  
 Recommended Suitable For Inclusion  
 In The National Wilderness Preservation System)



## CANNIBAL PLATEAU FURTHER PLANNING AREA

The Colorado Wilderness Act of also directed the Forest Service to address the suitability or unsuitability of the Cannibal Plateau Further Planning Area for inclusion in the National Wilderness Preservation System (NWPS) and the Act provides that wilderness potential be maintained during the study period. The following four alternatives are considered:

### Alternatives Cannibal Plateau Further Planning Area

Alternative A - This is the No Action alternative. The entire Cannibal Plateau Further Planning Area is unsuitable for inclusion in the National Wilderness Preservation System. The Further Planning Area will be managed for non-market output opportunities. Figure II-4 displays the Cannibal Plateau Further Planning Area. This alternative is part of Final EIS Alternatives 2 and 9.

This alternative manages the Cannibal Plateau Further Planning Area with the following land management allocations: 30,203 acres in Prescription 2A with an emphasis on semi-primitive motorized recreation opportunity; 1,287 acres in Prescription 5A with an emphasis on non-forestland big game winter range; and 300 acres in Prescription 10C with an emphasis on special interest areas - National Natural Landmarks.

Alternative B - Thirteen thousand five hundred ninety-nine acres are suitable for inclusion in the National Wilderness Preservation System. The boundary has been modified in the Final EIS to reduce conflicts with the BLM's proposed Powderhorn Wilderness. In this alternative 18,391 acres of the Cannibal Plateau Further Planning Area are unsuitable for inclusion in the National Wilderness Preservation System. The Further Planning Area will be managed for non-market output opportunities. Figure II-5 displays this boundary. This alternative is part of Final EIS Alternatives 1, 6 and 8.

Acres were recalculated in the Final EIS from official land status records through section acreage counts. The unsuitable area includes existing special uses and contains high potential for snowmobiling. Figure II-5 displays Alternative B.

This alternative manages the Cannibal Plateau Further Planning Area with the following land management allocations: non-wilderness - 12,108 acres in Prescription 2A with an emphasis on semi-primitive motorized recreation opportunity; 5,983 acres in Prescription 6B with an emphasis on livestock grazing; wilderness - 1,723 acres in Prescription 8A with an emphasis on pristine wilderness setting; 728 acres in Prescription 8B with an emphasis on primitive wilderness setting; 4,596 acres in Prescription 8C with an emphasis on semi-primitive wilderness setting and 300 acres in Prescription 10C with an emphasis on special interest areas - National Natural Landmarks.

Alternative C - In this alternative the entire Cannibal Plateau Further Planning Area is suitable for inclusion in the National Wilderness Preservation System. Figure II-4 displays the Cannibal Plateau Further Planning Area. This alternative is part of Final EIS Alternatives 4 and 7.

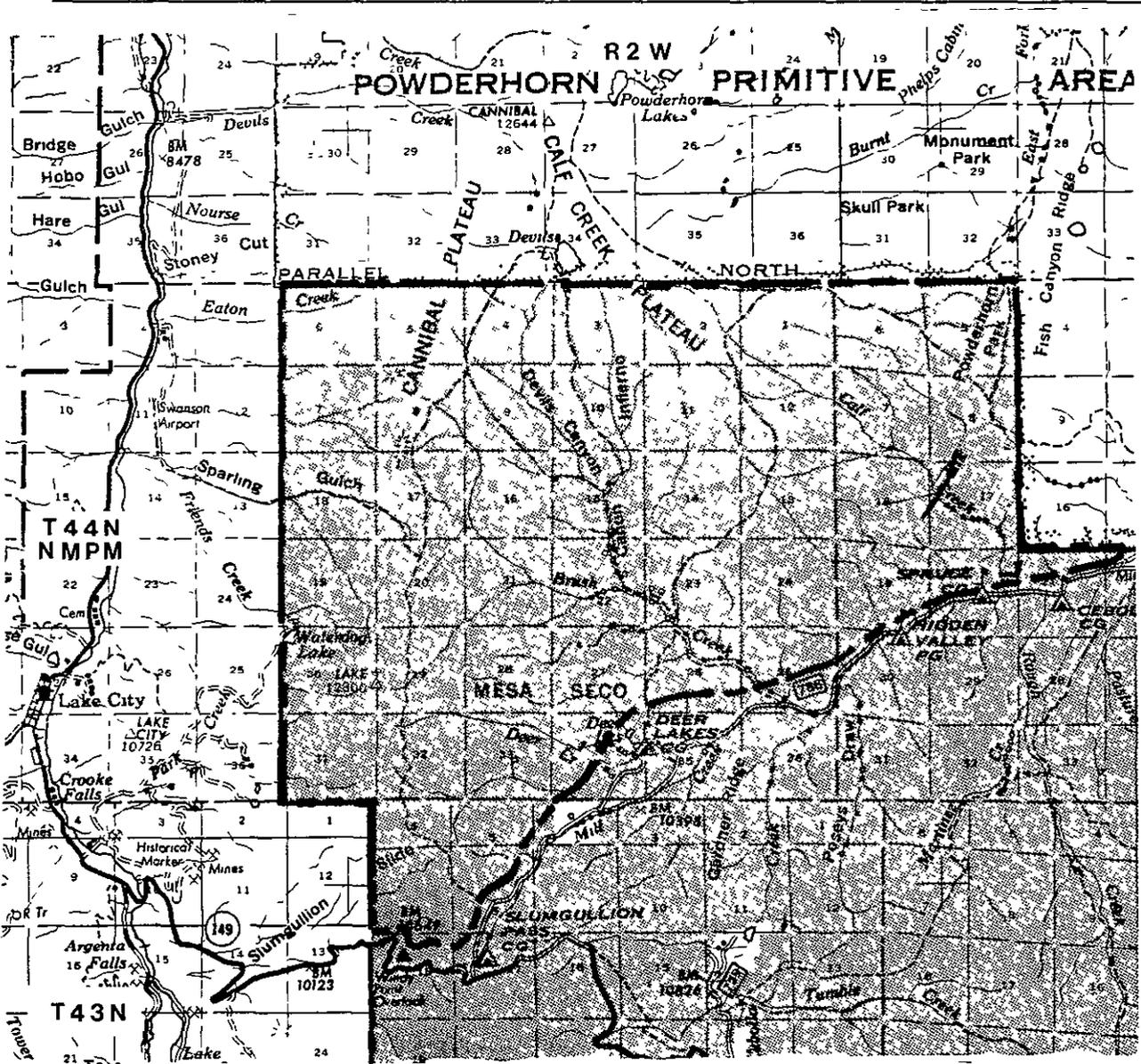
This alternative manages the Cannibal Plateau Further Planning Area with the following land management allocations: 1,619 acres in Prescription 8A with an emphasis on pristine wilderness setting; 13,464 acres in Prescription 8B with an emphasis on primitive wilderness setting; 15,871 acres in Prescription 8C with an emphasis on semi-primitive wilderness setting; and 1,036 acres in Prescription 8D with an emphasis on high-density wilderness setting.

Alternative D - In this alternative the entire Cannibal Plateau Further Planning Area unsuitable for inclusion in the National Wilderness Preservation System. This alternative was added to the Final EIS to provide an opportunity to schedule outputs for the FPA because of its administrative status. The WSA will be managed for market output opportunities. Figure II-4 displays the 31,990 unsuitable acres for Cannibal Plateau Further Planning Area.

This alternative manages the Cannibal Plateau Further Planning Area with the following land management allocations: 3,467 acres in Prescription 2A with an emphasis on semi-primitive motorized recreation opportunity; 489 acres in Prescription 2B with an emphasis on roaded natural and rural recreation opportunity; 1,487 acres in Prescription 5A with an emphasis on non-forested big game winter range; 946 acres in Prescription 5B with an emphasis on forestland big game winter range; 15,589 acres in Prescription 6B with an emphasis on livestock grazing; 9,712 acres in Prescription 7E with an emphasis on intensive timber management; and 300 acres in Prescription 10C with an emphasis on special interest areas - National Natural Landmarks.

FIGURE II-4.

CANNIBAL PLATEAU FURTHER PLANNING AREA  
(Alternatives A, C, and D; 31,990 Acres)



Further Planning  
Area Boundary





## COMPARISON OF ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

This section displays the differences between the alternatives. The comparison tables and figures are based on detailed information presented in Chapters III and IV. The items displayed were selected on the basis of their responsiveness to issues, concerns, and NEPA requirements.

Table II-22 displays the land management allocations for each alternative. Land management allocations are determined by goals and objectives of each alternative.

Table II-23 compares the planning question resolution for each alternative.

Figures II-6 through II-14 display selected outputs by current level (C), Benchmark 3 (BM3), and each alternative for years 1991-2000.

Figures II-15 through II-17 display the timber schedule for 240 years for Benchmark 3 and each alternative.

TABLE II-22.

ACREAGE ALLOCATION BY MANAGEMENT AREA PRESCRIPTION FOR EACH ALTERNATIVE  
(Acres)

Mgmt. Area Prescription	Emphasis	Alternatives								
		1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
1A	National Forest System Developed Recreation Sites.	1,117	955	1,279	1,279	955	1,117	955	1,117	955
1B	Existing winter sports sites.	8,191	8,191	8,191	8,191	8,191	8,191	8,191	8,191	8,191
1D	Utility corridors and electronic sites.	4,535	4,535	4,535	4,535	4,535	4,535	4,535	4,535	4,535
2A	Semi-primitive motorized recreation opportunities. Range management will reduce conflicts between recreation and livestock.	490,433	490,077	482,595	566,874	477,463	591,883	461,589	493,303	850,144
2B	Roaded natural and rural recreation opportunities. Major travel routes. Maintained or improved visual quality. Range management will reduce conflicts between recreation and livestock. Timber harvest.	140,000	125,446	130,429	127,859	129,679	127,859	130,186	131,021	0
3A	Semi-primitive non-motorized recreation opportunities. User density is controlled by access.	36,391	94,812	39,228	84,811	56,413	84,784	63,977	49,159	0
4B	Wildlife habitat management for one or more management indicator species. Livestock grazing will be compatible with wildlife habitat management.	104,757	128,135	129,285	156,520	130,975	165,298	118,886	140,828	155,867
4C	Wildlife habitat improvement. Vegetation treatment in hardwood and shrub dominated land. Livestock grazing will be compatible with wildlife habitat management.	221,796	222,275	191,403	227,270	131,624	227,243	113,067	222,853	88,423
4D	Wildlife habitat management. Livestock grazing will be compatible with wildlife habitat management. Clearcut aspen only. Slopes less than 40%.	21,139	27,496	28,162	67,959	27,213	67,941	48,921	51,353	23,399

TABLE II-22. (Cont.)

Mgmt. Area Prescription	Emphasis	Alternatives								
		1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
5A	Big game winter range in non-forest areas. Travel management prevents unacceptable stress. Livestock grazing managed to favor wildlife habitat.	206,305	210,496	207,616	220,097	220,428	220,097	202,023	214,023	229,731
5B	Big game winter range in forest areas. Travel management prevents unacceptable stress. Vegetation treatment will enhance plant and animal diversity. Livestock grazing managed to favor wildlife habitat.	36,389	32,198	35,078	22,597	22,266	22,597	40,671	28,671	12,963
6A	Livestock grazing. Improve forage composition. Vegetation treatment in mountain grass, meadow, and shrub; oakbrush; and aspen types. All slopes.	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001	1,001
6B	Livestock grazing. Maintain forage composition. Vegetation treatment in mountain grass, meadow, and shrub; oakbrush; and aspen types. All slopes.	797,144	770,005	796,957	670,401	861,504	676,040	855,414	741,005	847,493
7A	Intensive timber management. Clearcut harvest in aspen, spruce-fir, and lodgepole pine types. Slopes less than 40%.	18,926	6,388	22,243	5,076	20,060	4,263	10,310	9,066	4,598
7C	Intensive timber management. Clearcut harvest in lodgepole pine type. Group Selection harvest in spruce-fir type. Slopes greater than 40%.	3,221	3,074	16,808	768	3,192	1,774	5,447	5,821	2,622
7E	Intensive timber management. Shelterwood harvest in spruce-fir and ponderosa pine types. Clearcut lodgepole pine. Slopes less than 40%.	296,097	275,886	306,510	157,125	305,821	148,723	257,190	285,495	171,048
8A	Pristine wilderness setting. Very high levels of solitude. High opportunity for challenge, risk and self-reliance. No trails present.	105,475	103,752	103,752	206,382	103,752	100,134	189,628	105,475	103,752

TABLE II-22. (Cont.)

Mgmt. Area Prescription	Emphasis	1 Proposed	2 No Action	3 RPA	Alternatives					
					4	5	6	7	8	9
BB	Primitive wilderness setting. High level of solitude. High opportunity for challenge, risk, and self-reliance.	185,464	172,076	172,076	220,065	172,076	256,459	200,907	179,356	172,076
8C	Semi-primitive wilderness setting. Moderate level of solitude. Moderate opportunity for challenge, risk, and self-reliance.	176,278	165,700	165,700	87,286	165,700	106,086	116,013	170,296	165,700
8D	High density wilderness setting. Heavy day use. Low level of solitude. Low opportunity for challenge, risk, and self-reliance.	0	12,090	12,090	19,275	12,090	38,838	26,460	12,090	12,090
9A	Riparian area management. One hundred feet of perennial stream edges. Does not apply to wildernesses, special interest areas, and research natural areas.	25,826	25,897	25,897	25,414	25,897	25,622	25,414	25,826	25,897
9B	Intensive water augmentation. Increase water quantity on suitable timberland. Snowpack management.	14,580	14,580	14,580	14,580	14,580	14,580	14,580	14,580	14,580
10A	Research Natural Areas.	1,461	1,461	1,111	1,461	1,111	1,461	1,461	1,461	1,461
10C	Special Interest Areas. Cultural Areas. National Natural Landmarks.	1,061	1,061	1,061	761	1,061	1,061	761	1,061	1,061
10E	Municipal Watersheds.	7,440	7,440	7,440	7,440	7,440	7,440	7,440	7,440	7,440

TABLE II-23.

COMPARISON, PLANNING QUESTION RESOLUTION BY ALTERNATIVE  
(Average Annual Output For Year 1991-2000)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives										
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9		
1	HOW MUCH AND WHAT TYPE OF RECREATION OPPORTUNITIES SHOULD THE FOREST PROVIDE?	A. Developed Recreation Site Capacity. (By Decade)	MRVD											
		1980 - 1990		744	744	744	744	744	744	744	744	657		
		1991 - 2000		778	744	812	812	744	778	744	778	657		
		2001 - 2010		866	744	968	968	744	866	744	866	657		
		2011 - 2020		924	744	1,124	1,124	744	924	744	924	657		
		2021 - 2030		1,012	744	1,280	1,280	744	1,012	744	1,012	657		
		B. Developed Recreation Management Level (Full Service-Reduced Service).	Percent FSM/RSM	45/55	45/55	45/55	58/42	31/69	42/58	31/69	58/42	0/100		
		C. Downhill skiing capacity.	PAOT	35,200	35,200	35,200	35,200	35,200	35,200	35,200	35,200	35,200		
		2	HOW MUCH ROADLESS NON-WILDERNESS RECREATION OPPORTUNITY SHOULD THE FOREST PROVIDE AND WHERE SHOULD IT BE LOCATED?	A. Area allocated to semi-primitive non-motorized recreation outside wilderness.	Percent Acres	16.6	14.5	15.9	13.9	14.8	14.1	14.1	14.2	16.4
				B. Demand for semi-primitive non-motorized recreation.		482,400	420,500	463,250	404,200	431,400	408,400	408,950	412,350	477,900
Demand for semi-primitive non-motorized recreation will be met in all alternatives. Non-wilderness acres currently suitable for dispersed non-motorized recreation will in the future be roaded under some prescriptions. All single purpose, newly constructed roads will be closed. 'Transportation System Management', Plan, Chapter III, provides direction to assure semi-primitive non-motorized recreation opportunities in all alternatives. The Continental Divide National Scenic Trail Corridor will be managed primarily for recreation use. See alternative maps for location.														
C. Wild and Scenic Rivers.				The Taylor River and the East River were determined not to be eligible for a subsequent formal Wild and Scenic River Study. See Planning Question 12 for trail construction and reconstruction plans by alternative.										
3	WHAT TYPE OF WILDERNESS MANAGEMENT IS NEEDED TO MAINTAIN THE QUALITY OF THE RECREATION EXPERIENCE IN EXISTING AND PROPOSED WILDERNESS AREAS?	A. Management Area Prescription** (Wilderness)	Acres											
		High Density (8D)		0	12,090	12,090	19,275	12,090	38,838	26,460	12,090	12,090		
		Semi-Primitive (8C)		176,278	165,700	165,700	87,286	165,700	106,086	116,013	170,296	165,700		
		Primitive (8B)		185,464	172,076	172,076	220,065	172,076	256,459	200,907	179,356	172,076		
		Pristine (8A)		105,475	103,752	103,752	206,382	103,752	100,134	189,628	105,475	103,752		
		B. Wilderness Management Level (Full Service/Reduced Service)	Percent FSM/RSM	60/40	20/80	20/80	60/40	20/80	60/40	60/40	60/40	40/60	0/100	

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TABLE II-23. (Cont.)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives								
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
4	SHOULD CANNIBAL PLATEAU FURTHER PLANNING AREA AND FOSSIL RIDGE WILDERNESS STUDY AREA BE RECOMMENDED FOR WILDERNESS DESIGNATION?	A. Portion of Cannibal Plateau suitable for Wilderness.	Acres	13,599	0	0	31,990	0	13,599	31,990	13,599	0
			Percent	43	0	0	100	0	43	100	43	0
		B. Portion of Fossil Ridge suitable for Wilderness.	Acres	0	0	0	47,400	0	34,300	47,400	0	0
			Percent	0	0	0	100	0	72	100	0	0
		C. Total Wilderness Acreage.**	Acres	515,376	501,777	501,777	581,167	501,777	549,676	581,167	515,376	501,777
		D. Oh-Be-Joyful.		A Draft Environmental Impact Statement for Oh-Be-Joyful Wilderness Study Area was transmitted to the Environmental Protection Agency on June 4, 1981. The Forest Service's preferred alternative is that the area is unsuitable for inclusion in the National Wilderness Preservation System. The administration is currently completing the Final EIS.								
5	HOW MUCH HABITAT (FORAGE/COVER/WATER) SHOULD BE AVAILABLE FOR WILDLIFE AND FISH?	A. Area protected for Threatened and Endangered species.	Acres	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104
		B. Total Area of Wildlife Emphasis.	Acres	590,386	620,600	591,544	694,443	532,506	703,176	538,624	657,728	510,383
				Forest Direction, Plan, Chapter III, provides direction for managing the habitat needs of indicator species in all alternatives. Management area prescription 9A has been added in all alternatives. The prescription emphasizes riparian area management. Resource use will be managed to protect and maintain the riparian area in all alternatives.								
6	WHERE AND HOW MUCH FORAGE SHOULD BE ALLOCATED TO BIG GAME USE?	A. National Forest System winter range carrying capacity.	Animals	87,600	87,800	88,500	86,400	88,100	86,700	86,600	87,700	86,200
		B. Wildlife Habitat Improvement.	Number	10	35	35	10	30	10	47	10	0
		--Structural	Acres	7,998	7,800	7,998	9,800	6,398	9,800	7,830	1,560	4,130
		C. Winter Range Management Area Prescription**										
		--Non-Forest (5A)	Acres	206,305	210,496	207,616	220,097	220,428	220,097	202,023	214,023	229,731
		--Forest (5B)		36,389	32,198	35,078	22,597	22,266	22,597	40,671	28,671	12,963
				The total big game winter range acreage (242,694) is the same for all alternatives. Alternative maps attached to the Final EIS display big game winter range.								
7	WHERE AND HOW MUCH FORAGE SHOULD BE ALLOCATED TO LIVESTOCK USE?	A. Livestock carrying capacity.	AUM	335,800	333,300	339,900	309,900	349,800	309,900	349,900	336,700	315,000
				Grazing capacity is increased by increasing investments in structural and non-structural range improvements (Alternatives 1,2,3,5,7,8). Approximately 95% of the suitable rangelands are in satisfactory condition. Intensive management implemented through individual Allotment Management Plans could bring all rangelands to a satisfactory condition by 1990 in all alternatives.								

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TABLE II-23. (Cont.)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives								
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
8	HOW SHOULD FOREST PRODUCTS BE MANAGED TO SUPPLY COMMERCIAL AND NON-COMMERCIAL DEMANDS ON THE FOREST?	A. Forested area not capable of commercial timber production.	Acres	848,337	848,337	848,337	848,337	848,337	848,337	848,337	848,337	848,337
		B. Capable area not available for commercial timber production.	Acres	244,683	245,856	222,952	267,318	222,952	251,196	267,318	226,041	222,952
		C. Available area not suited for commercial timber production.	Acres	652,809	682,339	643,581	795,113	671,761	819,389	671,214	694,426	939,625
		D. Available area suited for commercial timber production.	Acres	476,251	445,548	507,210	311,312	479,030	303,158	435,211	450,276	331,227
		E. Forested area treated to improve wildlife habitat.	Acres	57,528	59,694	63,240	90,556	49,479	90,538	89,592	80,024	44,305
		F. Programmed Sales Offered.	MMBF	35.0	28.0	44.2	13.5	35.0	13.5	30.0	15.0	22.0
		G. Acres Treated by Harvest Method.	Acres									
		--Clearcut		747	270	1,388	209	748	207	523	574	389
--Shelterwood		5,281	3,767	6,091	2,444	5,280	2,443	5,050	5,663	3,519		
H. Long-Term Sustained Yield Capacity	MMBF	104.9	104.1	115.6	55.9	117.0	57.1	96.9	109.5	62.6		
The current, approved timber management plan on standard and special timberland is 35.0 MMBF.												
9	WHAT SURFACE RESOURCE USES SHOULD BE PERMITTED IN MUNICIPAL WATERSHEDS?	All alternatives manage surface resources to prevent degrading water quality below Federal, State, and local water standards. Management area prescription 10E has been added in all alternatives to protect or improve the quality and quantity of municipal water supplies. The prescription is applied to the Fruita Division (7,440 acres) in all alternatives										
10	HOW SHOULD THE FOREST RESPOND TO INCREASING DEMANDS FOR WATER?	A. Increased water yield (1st decade).	Percent	0.4	0.3	0.4	0.2	0.4	0.2	0.3	0.5	0.2
		B. Increased water yield (5th decade).	Percent	0.7	0.5	0.7	0.5	0.7	0.5	0.6	0.9	0.4
		C. Estimate cumulative water yield increase (50 yr. period)	Ac Ft	823,835	585,600	887,300	608,500	800,300	596,300	713,400	1,062,800	497,260
		D. Portion water yield increase potential** achieved (50 years).	Percent	29.0	21.1	28.7	20.9	28.1	20.5	25.0	37.2	18.8
		E. Estimate cumulative sediment yield increase from activities to increase water yield (50 yr. period).	Ac Ft	75	54	80	56	73	54	66	98	46
Water yield increase will be the vegetation treatment goal undertaken for timber, range, and wildlife management purposes in watersheds identified to have the potential for producing more water without detrimental effects on stream channel stability and water quality. Management area prescription 9B emphasizes increased water yield on 14,580 acres in all alternatives												

TABLE II-23. (Cont.)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives									
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9	
11	HOW SHOULD THE FOREST COORDINATION WITH OTHER RESOURCE VALUES**?	A. Area recommended available for leasing with surface occupancy.	Acres	76,418	0	70,768	129,633	70,768	105,230	129,633	76,418	70,768	
		-within wilderness.		2,041,637	2,011,370	2,066,692	1,998,995	2,053,245	2,032,839	1,989,722	2,053,385	2,068,417	
		-outside wilderness.											
		B. Area recommended available for leasing with no surface occupancy.	Acres	104,807	0	99,337	116,100	99,337	110,295	116,100	104,807	99,337	
		-within wilderness.		210,679	188,819	200,202	194,498	212,052	192,440	209,139	208,209	208,730	
		-outside wilderness.											
		C. Area recommended unavailable for leasing.	Acres	285,992	453,618	283,513	287,275	283,513	285,992	287,275	285,992	283,513	
		-within wilderness.		185,494	251,220	184,515	178,526	186,112	178,231	173,158	176,216	174,262	
		-outside wilderness.											
		D. Minerals Role.											
12	WHAT TYPE OF TRANSPORTATION SYSTEM IS NECESSARY TO MANAGE THE FOREST AND ITS RESOURCES?	A. Increase in Forest road mileage. (1st ten years)	Percent	7	6	7	2	8	2	6	6	5	
		B. Construction/Reconstruction. (1st ten years)	Miles	57	49	57	11	58	11	47	43	36	
		Arterials		45	38	44	9	45	9	36	34	28	
		Collectors		216	185	216	43	219	43	176	164	137	
		Locals		15	9	15	5	15	5	12	14	9	
		Bridges		16	16	23	3	17	3	14	17	10	
		C. Increase in Forest road mileage. (50 year period)	Percent	693	660	962	144	705	144	579	504	437	
		D. Trail construction/reconstruction. (1st ten years)	Miles	500	150	110	1,000	150	500	150	150	0	
		E. Trail construction/reconstruction. (50 year period)	Miles	2,450	750	2,120	2,450	750	2,450	750	750	750	0

Forest Direction, Plan, provides travel management direction in all alternatives.

TABLE II-23. (Cont.)

PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives								
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
13	HOW SHOULD THE FOREST HANDLE PROBLEMS CAUSED BY PRIVATE LAND WITHIN AND ADJACENT TO THE NATIONAL FOREST?	A. Land Exchange.	Acres	Priority for private land exchange is determined by management area prescription of the adjacent land in the alternative selected. The acres exchanged is more dependent on the Forest's funding to process exchanges than on the alternative selected.								
		B. Right-of-Way Acquisition.	Cases	8	8	8	7	8	7	7	8	7
		C. Occupancy Trespass.	Cases	23	23	23	23	23	23	23	23	23
		D. Landline Location.	Miles	20	20	25	15	20	20	20	20	15
		E. Right-of-Way Grants.	Cases	30	30	30	30	30	30	30	30	30
14	WHERE SHOULD THE FOREST PROVIDE UTILITY CORRIDORS AND HOW SHOULD THEY BE MANAGED?			The designation of new utility corridors will be studied on a case-by-case basis regardless of the alternative, but will be consistent with the plans and programs of other agencies. The Rocky Mountain Regional Guide establishes standards and guidelines to be used by the Forest in activities related to utility corridors. Expanding compatible uses in existing corridors is emphasized over new corridor development. The permitting and NEPA processes to be followed when authorizing use and occupancy are located in Forest Service Manuals. Management area prescription ID provides for utility corridors in all alternatives. Management activities within these linear corridors strive to be compatible with the goals of the management area through which the corridors pass.								
15	CAN SERVICE TO THE PUBLIC AND ADMINISTRATION BE IMPROVED WITH FOREST OR DISTRICT BOUNDARY CHANGES?	A. Land Exchange Opportunities	Acres	Land exchange opportunities exist between the Forest Service and BLM, and between the Forest Service and National Park Service. A discussion of the exchange program can be found in the appendices of the accompanying Plan. The Forest has tentatively identified 354,800 acres for possible jurisdictional land transfer between the Forest and the BLM. The Forest has tentatively identified 760 acres for possible transfer to the National Park Service. There are no district boundary changes proposed in any alternative.								

TABLE II-23. (Cont.)

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PQ	Planning Question	Output or Effect to be Measured	Units*	Alternatives								
				1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
16	HOW SHOULD THE FOREST MANAGE SIGNIFICANT CULTURAL RESOURCES? (And other Special Interest Areas)			<p>The Tabeguache Ponderosa Pine Area is recommended as proposed Research Natural Area in Alternatives 1, 2, 4, 6, 7, 8, and 9. Each alternative will protect all significant cultural resources by avoidance and or study. Areas containing potential cultural resources will be surveyed prior to ground disturbing activities. The Gothic Research Natural Area will retain its designation in all alternatives. The Dry Mesa Dinosaur Quarry and the Slumgullion Earthflow National Natural Landmark will continue to be managed as special interest sites. All alternatives propose management of the following as special management areas:</p> <p>The Alpine Tunnel Historic District.                      The Ophir Needles National Natural Landmark.                      Escalante Creek Research Natural Area.                      Mount Emmons Iron Bog.</p> <p>Management area prescriptions 10A and 10C provide for research natural areas and special interest areas in all alternatives. Slumgullion Earthflow National Natural Landmark retains its landmark designation in alternatives 4 and 7 and is also identified suitable for wilderness as part of Cannibal Plateau Further Planning Area.</p>								
17	HOW SHOULD THE FOREST MANAGE THE VISUAL RESOURCE?			<p>Forest Direction, Plan, applies the Visual Management System to all National Forest System land in all alternatives. Visual Resource Management plans, designs, and locates vegetation treatment in a scale which retains the color and texture of the characteristic landscape. In addition, each management area prescription for the alternatives identifies a series of Visual Quality Objectives.</p>								

\* % = Percent  
 FSM/RSM = Full Service Management/Reduced Service Management  
 AUM = Animal Unit Months  
 No. = Number  
 Ac Ft = Acre Feet  
 MMBF = Million Board Feet  
 RVD/Yr = Recreation Visitor Days per Year  
 POAT = Persons At One Time  
 No. An. = Number of Animals

\*\* PQ 3 &  
 PQ 11 - Reflects 88,901 acres of wilderness being displayed by San Juan and White River National Forests and 40,742 acres of wilderness outside the Forest being displayed by Grand Mesa, Uncompahgre, and Gunnison National Forests.

PQ 4 - This total includes acres only on Grand Mesa, Uncompahgre, and Gunnison National Forests for the Big Blue, Collegiate Peaks, La Garita, Lizard Head, Maroon Bells-Snowmass, Mount Sneffels, Raggeds, and West Elk Wildernesses. Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area are included only when suitable for wilderness in that alternative.

PQ 10 - Water yield increase potential based on tentatively suitable timberland on slopes less than 40 percent.

FIGURE II-6.

DEVELOPED RECREATION CAPACITY  
(Thousand Recreation Visitor Days)

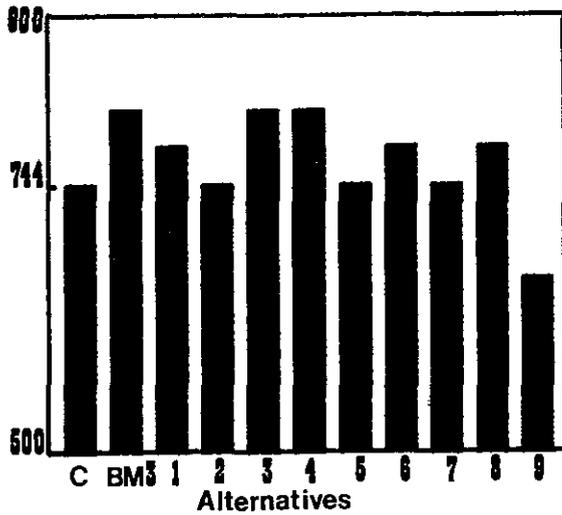


FIGURE II-7.

SEMI-PRIMITIVE NON-MOTORIZED  
RECREATION  
(Thousand Acres Outside Wilderness)

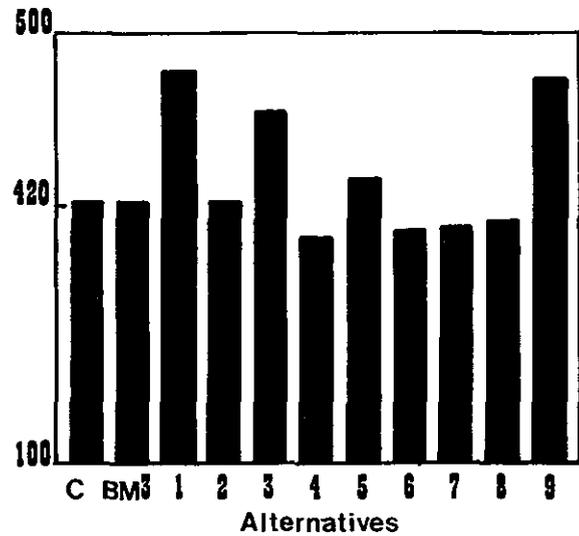


FIGURE II-8.

WILDERNESS MANAGEMENT  
(Thousand Acres)

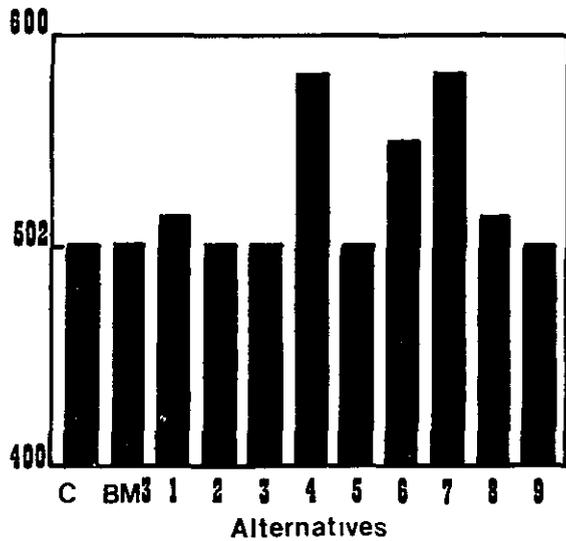


FIGURE II-9.

NATIONAL FOREST SYSTEM WINTER  
RANGE CARRYING CAPACITY  
(Thousand Animals)

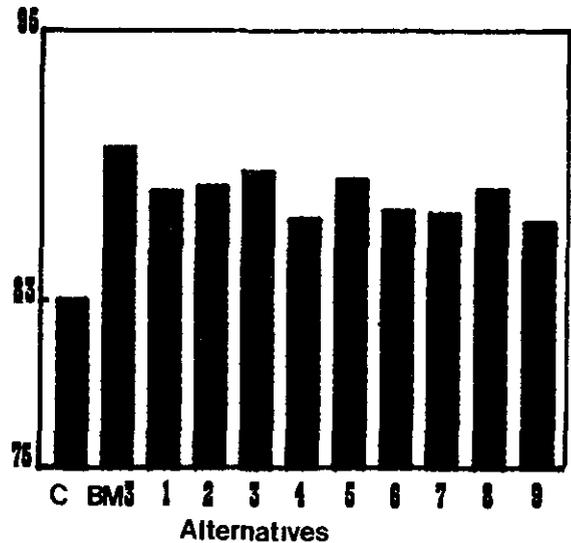


FIGURE II-10.

LIVESTOCK GRAZING  
(Thousand Animal Unit Months)

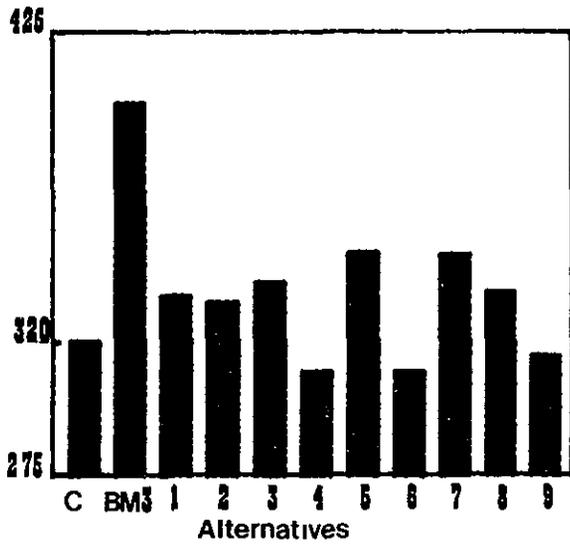


FIGURE II-11.

PROGRAMMED TIMBER SALES OFFERED  
(Million Board Feet)

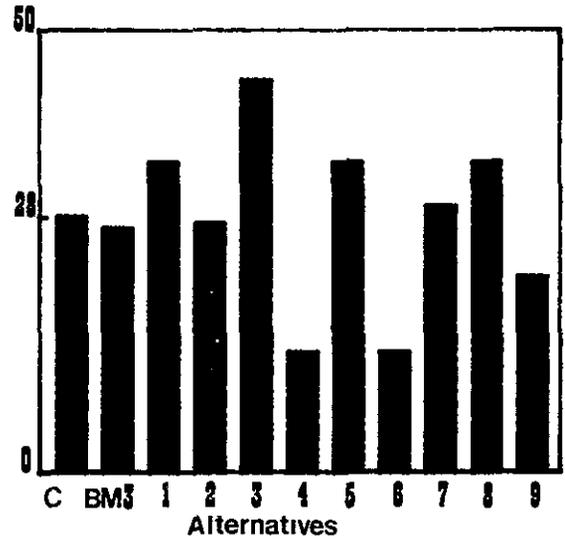


FIGURE II-12.

LONG-TERM SUSTAINED  
TIMBER YIELD  
(Million Board Feet)

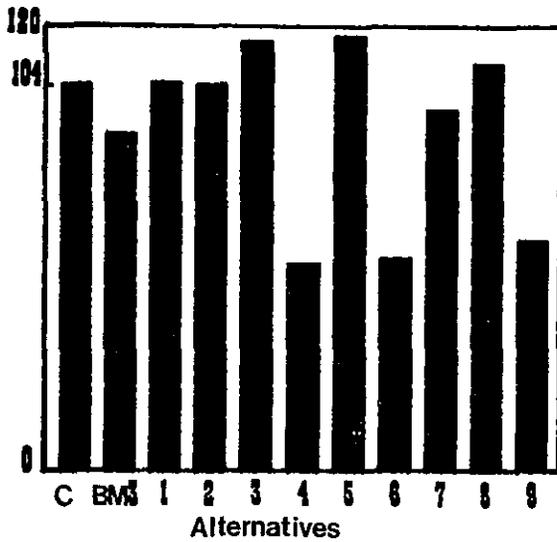


FIGURE II-13.

WATER YIELD  
(Million Acre Feet)

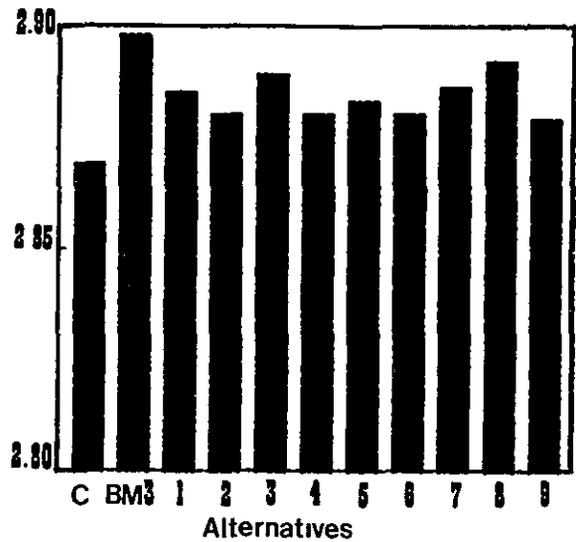


FIGURE II-14.

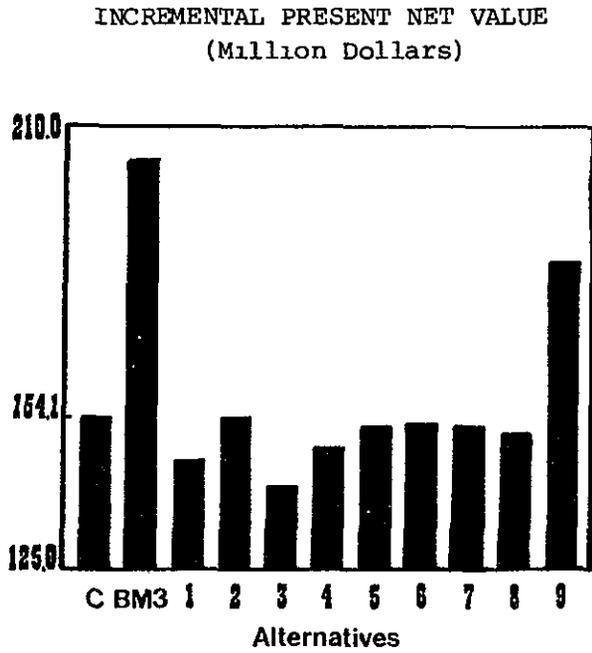


FIGURE II-15.

COMPARISON BASE SALE SCHEDULE  
(Alternatives 1, 2, 3; MMBF Per Decade)

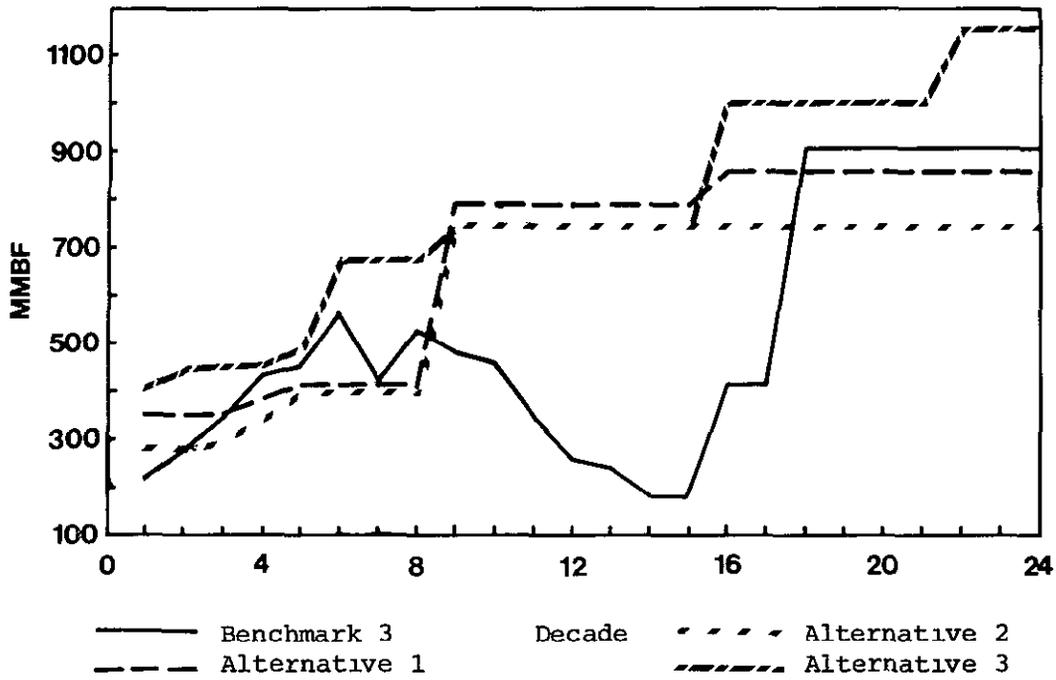


FIGURE II-16.

COMPARISON BASE SALE SCHEDULE  
(Alternatives 4, 5, 6; MMBF Per Decade)

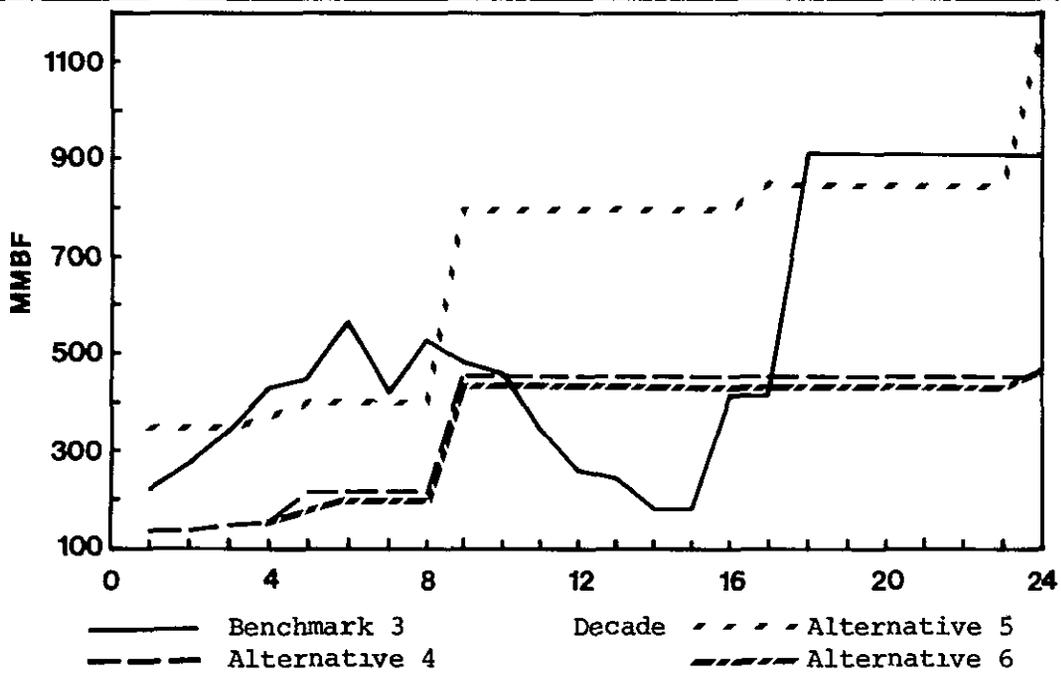
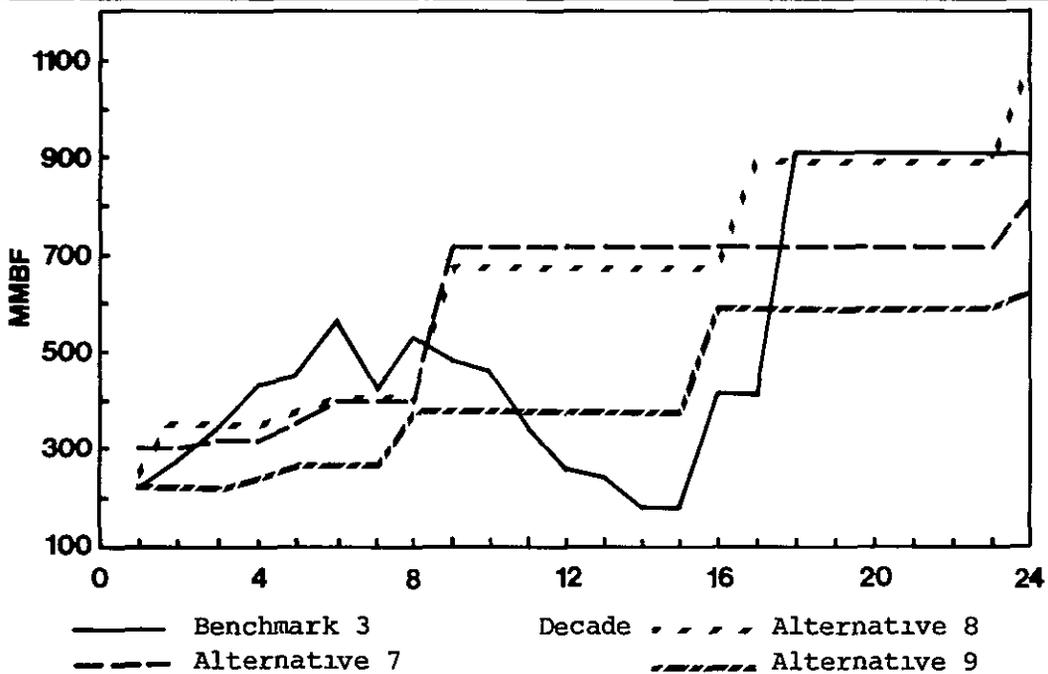


FIGURE II-17.

COMPARISON BASE SALE SCHEDULE  
(Alternatives 7,8,9; MMBF Per Decade)



Some significant social changes will take place in the 10-county planning area, regardless of alternative. These changes are related to energy, minerals, and downhill ski area development. These social changes are likely to occur throughout the planning area and will have a greater impact on the social resource values than any alternative impacts. Lifestyle; attitudes, beliefs, and values; social organization; and population and land use will not be significantly affected by National Forest system management in any alternative. Alternatives may generate some minor opportunities or problems. Change in outputs when compared to current management is not great enough to cause any significant problems within the planning area.

Quantitative economic differences between the alternatives are important to understanding the differences between the alternatives. Economic impacts in terms of cost-efficiency; expenditures and returns; population, employment, income changes; payments to counties; and present net value trade-off analysis are displayed. All values are in terms of 1978 dollars. Chapters III and IV present additional economic information.

Table II-24 compares budget expenditures and returns by alternative.

Table II-25 compares the cost-efficiency of Benchmark 1, Benchmark 3 and each alternative using a 4% discount rate.

Table II-26 compares population, income, employment, workforce unemployment rate, and payment to counties for each alternative.

Table II-27 summarizes resource output analysis by alternative over the planning horizon.

TABLE II-24.

EXPENDITURES AND RETURNS  
(Summary All Decades, Average Annual,  
Thousand 1978 Dollars)

Alternatives	Budget Expenditures	Returns to the U.S Treasury
Current Year	6,314.6	879.1
1	7,665.6	1,057.7
2	6,990.8	939.1
3	8,415.8	1,094.4
4	7,144.8	916.6
5	7,229.6	1,059.6
6	6,830.3	883.6
7	7,104.2	1,004.7
8	7,639.0	1,081.4
9	4,970.8	892.3

TABLE II-25.

COST EFFICIENCY ANALYSIS SUMMARY  
(Million 1978 Dollars)  
4% Discount Rate

	BM1*	BM3	Alternatives								
			1	2	3	4	5	6	7	8	9
Present Value Benefits, Incremental**	203.1	312.0	302.8	294.6	313.3	290.2	302.0	286.1	298.1	304.2	283.2
Assigned Values Less Receipts	191.0	295.9	286.9	279.0	296.8	275.3	286.1	271.0	282.4	288.2	268.3
Federal Receipts	12.1	16.1	15.9	15.6	16.5	14.9	15.9	15.1	15.7	16.0	14.9
Present Value Costs, Incremental	11.4	108.4	157.0	140.5	172.4	141.8	149.4	133.8	145.5	153.2	99.4
Forest Service, Long Range											
Fixed	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Investment	0.0	6.5	9.4	8.4	10.3	8.5	9.0	8.0	8.7	9.2	6.0
Operational	0.0	75.9	110.0	98.3	120.7	99.2	104.6	93.7	101.9	107.2	69.6
General Administration	0.0	10.8	15.7	14.1	17.3	14.2	14.9	13.4	14.5	15.4	9.9
Non-Forest Service - Cooperator Costs	4.1	15.2	21.9	19.7	24.1	19.9	20.9	18.7	20.4	21.4	13.9
Present Net Value, Incremental	191.7	203.6	145.8	154.1	140.9	148.4	152.6	152.3	152.6	151.0	183.8
Benefit Cost Ratio, Incremental	17.8	2.88	1.93	2.10	1.82	2.05	2.02	2.14	2.05	1.99	2.85

\* The figures for BM1, Minimum Level, are not "incremental". Figures for BM3 and the alternatives 1-9 are "incremental" to BM1.

\*\* All demand curves are horizontal. Consumer surplus is zero and not shown.

TABLE II-26

ECONOMIC IMPACT ANALYSIS  
(EIA-214 and EIA-215)

	Unit*	Base Year 1977	Change From Base Year By Alternative								
			1	2	3	4	5	6	7	8	9
<b>FIRST DECADE (1981-1990)</b>											
<b>Population</b>											
EIA-214	M Persons	113.0	3.02	2.34	3.18	2.43	3.04	2.43	2.90	3.02	2.67
EIA-215	M Persons	9.3	2.41	2.38	2.41	2.37	2.41	2.37	2.40	2.41	2.37
<b>Income</b>											
<b>EIA-214</b>											
<b>Employee</b>											
Compensation	MM\$	363.1	4.3	3.9	4.7	3.0	4.3	3.0	4.0	4.3	3.5
Property Income	MM\$	252.0	2.3	2.0	2.5	1.3	2.4	1.3	2.2	2.3	1.6
Total Income	MM\$	615.1	6.6	5.9	7.2	4.3	6.7	4.3	6.2	6.6	5.1
<b>EIA-215</b>											
<b>Employee</b>											
Compensation	MM\$	28.6	3.2	3.2	3.2	3.1	3.2	3.1	3.2	3.2	3.1
Property Income	MM\$	21.0	2.0	2.0	2.0	1.9	2.0	1.9	2.0	2.0	2.0
Total Income	MM\$	49.6	5.2	5.2	5.2	5.0	5.2	5.0	5.2	5.2	5.1
<b>Employment</b>											
<b>EIA-214</b>											
Agriculture	M Jobs	1.424	.016	.013	.019	.004	.018	.004	.015	.016	.007
Mining	M Jobs	2.901	.003	.003	.003	.002	.003	.002	.003	.003	.002
Manufacturing	M Jobs	4.111	.049	.049	.050	.047	.050	.047	.049	.049	.048
Lumber/Wood											
Products	M Jobs	2.220	.056	.027	.079	-.003	.054	-.033	.035	.056	.002
Transportation	M Jobs	2.450	.011	.010	.012	.008	.011	.008	.011	.011	.009
Wholesale/Retail	M Jobs	8.662	.116	.113	.118	.111	.117	.111	.115	.116	.113
Services	M Jobs	9.079	.345	.343	.347	.338	.346	.338	.344	.345	.341
<b>Total</b>		<b>30.85</b>	<b>.596</b>	<b>.558</b>	<b>.629</b>	<b>.477</b>	<b>.599</b>	<b>.477</b>	<b>.572</b>	<b>.596</b>	<b>.522</b>
<b>EIA-215</b>											
Agriculture	M Jobs	.056	.012	.012	.013	.011	.013	.011	.013	.012	.011
Mining	M Jobs	.479	.002	.002	.002	.001	.002	.001	.002	.002	.001
Manufacturing	M Jobs	.075	.030	.030	.030	.030	.030	.030	.030	.030	.030
Lumber/Wood											
Products	M Jobs	.105	.004	.003	.005	-.001	.003	-.001	.003	.004	.001
Transportation	M Jobs	.076	.009	.009	.009	.009	.009	.009	.009	.009	.009
Wholesale/Retail	M Jobs	.659	.109	.109	.109	.108	.109	.108	.109	.109	.108
Services	M Jobs	.965	.322	.321	.322	.321	.322	.321	.322	.322	.321
<b>Total</b>		<b>2.415</b>	<b>.488</b>	<b>.486</b>	<b>.490</b>	<b>.479</b>	<b>.488</b>	<b>.479</b>	<b>.488</b>	<b>.488</b>	<b>.481</b>
<b>Workforce Unemployment Rate</b>											
EIA-214	%	4.8	4.7	4.4	4.8	4.8	4.8	4.8	4.8	4.7	4.8
EIA-215	%	3.9	2.0	2.4	2.0	2.4	2.0	2.4	2.0	2.0	2.4
<b>Payments to Counties**</b>											
	M \$										
Delta		14.6	19.3	16.6	20.5	14.3	19.1	14.3	18.2	19.5	15.5
Garfield		2.4	3.2	2.8	3.4	2.4	3.2	2.4	3.0	3.3	2.6
Gunnison		97.4	128.4	110.9	136.8	95.3	127.3	95.3	121.0	130.0	103.0
Hinsdale		14.6	19.3	16.6	20.5	14.3	19.1	14.3	18.2	19.5	15.5
Mesa		36.5	48.2	41.6	51.3	35.7	47.7	35.7	45.4	48.8	38.6
Montrose		24.3	32.6	27.7	34.2	23.8	31.8	23.8	30.3	32.5	25.8
Ouray		9.7	12.8	11.1	13.7	9.5	12.7	9.5	12.1	13.0	10.3
Saguache		26.8	35.3	30.5	37.6	26.2	35.0	26.2	33.3	35.8	28.3
San Juan		2.4	3.2	2.8	3.4	2.4	3.2	2.4	3.0	3.3	2.6
San Miguel		14.6	19.3	16.6	20.5	14.3	19.1	14.3	18.2	19.5	15.5

\* EIA = Economic Impact Area

M Persons = Thousand Persons

MM\$ = Million Dollars

\*\* Estimated Total Payments to Counties

% = Percentage

M\$ = Thousand Dollars

M Jobs = Thousand Jobs

TABLE II-27.

RESOURCE OUTPUT ANALYSIS BY ALTERNATIVE  
(Summary All Decades, Average Annual Output)

Output	Unit of Measure**	Current Year	Alternative								
			1 Proposed	2 No Action	3 RPA	4	5	6	7	8	9
<b>RECREATION</b>											
Developed Recreation Use (Inc VIS)	MRVD	578	847.2	726.4	968.0	968.0	726.4	847.2	726.4	847.2	653.0
Downhill Skiing Use	MRVD	222	689.1	689.1	689.1	689.1	689.1	689.1	689.1	689.1	689.1
Dispersed Rec Use (Inc Wildlife & Fish)	MRVD	1399	2339.2	2339.2	2339.2	2339.2	2339.2	2339.2	2339.2	2339.2	2339.2
Off-Road Motorized Use	MRVD	168	280.9	280.9	280.9	280.9	280.9	280.9	280.9	280.9	280.9
Trail Construction/ Reconstruction	Miles	0	49.0	15.0	42.4	49.0	15.0	49.0	15.0	15.0	0
<b>WILDERNESS</b>											
Wilderness Management	M Acres	501.8	515.4	501.8	501.8	581.2	501.8	549.7	581.2	515.4	501.8
Wilderness Use	MRVD	164	277.0	277.0	277.0	277.0	277.0	277.0	277.0	277.0	277.0
<b>FISH &amp; WILDLIFE</b>											
Wildlife Habitat Improvement (Aspen and Burning)	Acres	4,000	6,098	5,900	6,098	7,450	4,598	7,450	4,830	5,310	2,730
Threatened and/or Endangered Species Habitat Mgt	Acres	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104	19,104
Winter Range Carrying Capacity Deer & Elk	M Animals	82.7	87.1	87.5	88.0	86.2	87.6	86.4	86.2	87.2	85.9
Wildlife Structures	Numbers	35	10	35	35	10	30	10	44.4	10	0
<b>RANGE</b>											
Grazing Use (Livestock)	MAUM	320.0	334.2	332.0	338.1	310.9	346.8	310.9	346.8	335.0	315.0
<b>TIMBER</b>											
Programmed Sales Offered	MMBF	28.8	36.9	31.9	44.8	15.6	36.5	14.8	31.6	35.5	22.3
Reforestation	M Acres	638	.375	.289	.463	.218	.362	.229	.326	.365	.234
Timber Stand Improvement	M Acres	1.5	.530	.625	.530	.585	1.0	.585	.900	1.000	1.528
<b>WATER</b>											
Avg Annual Yield	M Ac ft	2,869.0	2,886.4	2,881.0	2,886.6	2,880.8	2,884.0	2,881.2	2,884.4	2,890.0	2,879.8
<b>MINERALS</b>											
Mineral Leases and Permits	# Op Plans	90	154.4	147.0	154.4	128.0	147.0	128.0	147.0	147.0	50.0
<b>SOILS</b>											
Soil & Water Res Imp (Imp. Watershed Condition)	Acres	80	66.0	64.0	66.0	52.0	104.0	52.0	57.0	104.0	0
Annual Soil Survey	Acres	0	61,000	61,000	61,000	61,000	61,000	61,000	61,000	61,000	0
<b>FACILITIES</b>											
Road Const/Reconst	Miles	8.1	2.48	2.38	3.47	.52	2.37	.52	2.09	1.82	1.57
Arterial Roads	Miles	1.4	1.94	1.85	2.69	.40	2.00	.40	1.60	1.41	1.22
Collector Roads	Miles										
<b>PROTECTION</b>											
Fuelbreaks & Treatment	M Acres	1.5	1.7	2.9	1.7	2.4	3.4	2.4	2.9	3.4	.2
Insect & Disease Survey	M Acres	1.0	4.1	4.1	4.1	7.8	3.3	7.8	4.7	4.1	0
<b>LANDS</b>											
Land Purchase & Acquis	Acres	0	0	0	0	0	0	0	0	0	0
Land Exchange Offer	Acres	440	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0	304.0
ROW Acquisition	Cases	11	8.5	8.5	8.5	7.3	8.5	7.3	6.9	8.5	7.3
Occupancy Trespass	Cases	5	14.1	14.1	14.1	21.9	14.1	21.9	14.1	14.1	21.9
Landline Location	Miles	31	20.5	20.0	25.5	15.5	20.5	20.0	20.0	20.5	15.5
<b>HUMAN AND COMMUNITY DEVELOPMENT *</b>											
Human Resource Program	Enrollee Years	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28	19.28
Job Corps	Enrollee Years	0	0	0	0	0	0	0	0	0	0
YCC	Enrollee Years	0	0	0	0	0	0	0	0	0	0

\* Human Resource Programs are not included after 1985.

\*\*MRVD = Thousand Recreation Visitor Days  
M Acres = Thousand Acres  
M Animals = Thousand Animals  
MAUM = Thousand Animal Unit Months  
YCC = Youth Conservation Corp

MMBF = Million Board Feet  
M Ac Ft = Thousand Acre Feet  
# Op Plans = Number of Operating Plans  
VIS = Visitor Information Service

## PRESENT NET VALUE TRADE-OFF ANALYSIS

This analysis summarizes the differences between alternatives considered in detail and compares them to the maximum PNV Benchmark (Benchmark 3). Appendix E presents additional data used in the PNV trade-off analysis. Table II-28 displays PNV, discounted benefit, and discounted cost differences between alternatives. Table II-29 is an incremental alternative display.

Benchmark 3 has relatively high present value benefits (PVB) and relatively low present value costs (PVC). It does not include costs for some activities required by Forest Service policy that do not produce valued benefits and are not needed to support benefit producing activities. Excluding the activities identified by these policies effectively lowers PVC and raises the PNV \$28.2 million (at the 4% discount rate). To assure each is implementable, alternatives considered in detail include the policy costs and display the effects in their PNV calculation.

Benchmark 3 is not subject to sustained yield timber production for the first 150 years. It requires a 22.0 MMBF harvest annually for the first decade. The timber harvest schedule raises the PVB of Benchmark 3, which subsequently results in a higher PNV.

The following constraints are applied to Benchmark 3: Threatened and endangered species habitat management, viable wildlife populations, soil and water protection, and 25% timber departure.

The following policy constraints are not applied to Benchmark 3 but do apply to all alternatives considered in detail: Recreation planning, cultural resource management, visual resource management, soils inventory, water resource planning, and transportation planning.

Many of these constraints require activities that do not produce a measured benefit. Appendix E, PNV trade-off analysis, discloses additional details regarding activities that do not produce a measured benefit.

TABLE II-28.

PRESENT NET VALUE TRADE-OFF ANALYSIS  
(Summary All Decades, Million 1978 Dollars)  
4% Discount Rate

	Alternatives										
	BM2*	BM3*	Highest PNV							Lowest PNV	
			9	2	7	5	6	8	4	1	3
Discounted Costs (PVC)	137.4	108.4	99.4	140.5	145.5	149.4	133.8	153.2	141.8	157.0	172.4
Discounted Benefits (PVB)	311.3	311.9	283.2	294.6	298.1	302.0	286.1	304.2	290.2	302.8	313.3
Present Net Value, Incremental (PNV)	173.9	203.6	183.8	154.1	152.6	152.6	152.3	151.0	148.4	145.8	140.9
difference in PNV (from BM3)			-19.8	-49.5	-51.0	-51.1	-51.3	-52.6	-55.2	-57.8	-62.7
difference in PVC (from BM3)			- 9.0	+32.1	+37.1	+41.0	+25.4	+44.8	+33.4	+48.6	+64.0
difference in PVB (from BM3)			-28.7	-17.3	-13.8	- 9.9	-25.8	- 7.7	-21.7	- 9.1	+ 1.4
Contributions made to Total											
Discounted Benefits by Resources											
Timber	17.9	11.9	15.2	18.8	15.2	18.8	6.7	19.0	6.8	18.9	22.0
Range	91.2	71.9	74.7	77.9	77.9	77.9	71.2	75.7	71.3	75.6	76.5
Recreation											
Developed	46.1	43.2	46.1	46.1	46.1	46.1	52.0	50.8	55.6	49.3	55.4
Dispersed	30.7	30.0	30.8	30.8	30.8	30.8	31.0	30.1	30.3	29.9	30.8
Winter Sports	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8	44.8
Wilderness	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1	26.1
Wildlife	54.7	52.1	53.2	53.2	53.5	53.5	51.1	53.2	51.9	54.3	53.8
Water	.4	3.2	3.7	3.7	3.7	3.9	3.3	4.5	3.4	3.9	3.9

\*BM2 = Benchmark 2  
BM3 = Benchmark 3

TABLE II-29.

INCREMENTAL ALTERNATIVE COMPARISON  
(Summary All Decades, Million 1978 Dollars, 4% Discount Rate)

	ALTERNATIVES								
	HIGHEST PN 9	2	7	5	6	8	4	1	LOWEST PN 3
Present Value Cost	99.4	140.5	145.5	149.4	133.8	153.2	141.8	157.0	172.4
Cost Difference*	+41.1	+5.0	+3.9	-15.6	+19.4	-11.4	+15.2	+15.4	
Present Value Benefit	283.2	294.6	298.1	302.0	286.1	304.2	290.2	302.8	313.3
Benefit Difference*	+11.4	+3.5	+3.9	-15.9	+18.1	-14.0	+12.6	+10.5	
Incremental Present Net Value	183.8	154.1	152.6	152.6	152.3	151.0	148.4	145.8	140.9
Present Net Value* Difference	-29.7	-1.5	-0.0	-0.3	-1.3	-2.6	-2.6	-4.9	

\* Indicates the difference in cost, benefit, and PN between alternatives.

### Comparison, Benchmark 3 and Alternative 9

Alternative 9 is the reduced budget alternative. It has the highest PNV, \$183.8 million, of the alternatives considered in detail. Discounted benefits are \$28.7 million less than Benchmark 3. Of this reduction, about two-thirds is due to decreased range benefits, and another 20% is due to reduced timber harvest volume and the shift to a non-declining flow schedule. Wildlife benefits are reduced slightly as is developed recreation. The decrease in benefits is off-set somewhat by an increase in water benefits.

Discounted costs are reduced to between \$9 million in Alternative 9. Additional costs are incurred for activities for which there are no priced benefits. These added costs reduce the alternative PNV to a level below Benchmark 3. The net reduction in present net value in Alternative 9 from Benchmark 3 is \$19.8 million.

The non-priced benefits result from the following activities: trail construction, developed recreation management level, cultural resource management, wilderness management level, prescribed burning, fish structures, and soil and water resource improvement.

### Comparison, Alternative 9 and Alternative 2

Alternative 2 is the No Action alternative. Net discounted benefits are \$11.4 million more in Alternative 2 than in Alternative 9. This results primarily from an increased timber program in Alternative 2, 28.0 to 39.9 MMBF, compared to 22.0 to 23.7 MMBF for Alternative 9. There are also a slightly higher range levels, developed recreation outputs, and wildlife benefits associated with Alternative 2.

The net increase in discounted costs is \$41.1 million. This is substantially more than the net benefit increase. This includes costs for increased developed recreation management and investment, additional trail construction and reconstruction, more intensive wilderness management, fish structures, soil and water improvement, and insect and disease surveys.

These changes reduce the PNV \$29.7 million. The non-priced benefits associated with that part of the increase in costs not related to higher recreation benefits, result from the following activities: trail, wilderness, recreation, fisheries, soils and water, and insect and disease management.

### Comparison, Alternative 2 and Alternative 7

Alternative 7 emphasizes intensive management for market outputs. Discounted benefits increase \$3.5 million over Alternative 2. This is the result of a 4% increase in range benefits. All other benefits are the same or nearly the same for the two alternatives.

Total discounted costs are \$5.0 million higher for Alternative 7 than for Alternative 2. Trail construction and reconstruction, FA&O construction and reconstruction, and structural wildlife habitat improvements are higher for Alternative 7. These costs are somewhat off-set by higher costs in Alternative 2 for developed recreation management, soil monitoring, arterial and collector construction and reconstruction, and fuel management.

Present net value for Alternative 7 is \$1.5 million less than for Alternative 2. Non measured benefits include wilderness management and insect and disease management.

#### Comparison, Alternative 7 and Alternative 5

Alternative 5 is the market opportunity alternative. Due to an increase in timber benefits of \$3.6 million in Alternative 5 above Alternative 7, discounted benefits increase by \$3.9 million except for the increased timber benefits and a slight increase in water benefits for Alternative 5, there are no other differences in benefits between the two alternatives. .

Discounted costs also increase \$3.9 million in Alternative 5. Most of the \$3.9 million increase in discounted costs above Alternative 7 can be attributed to the increased timber outputs. Other costs are attributed to insect and disease management and reduced fisheries impact.

Overall, incremental PNV is reduced less than \$.1 million from Alternative 7 to Alternative 5. Although the PNV is similar, costs for Alternative 7 stress protection and soil improvement while Alternative 5 costs stress wildlife programs.

#### Comparison, Alternative 5 and Alternative 6

Alternative 6 emphasized non-market outputs. Discounted benefits are \$15.9 million less in Alternative 6 than in Alternative 5. This is the result of a \$12.1 million reduction in timber benefits, and slight reductions in water, range and wildlife benefits. The above mentioned decrease in benefits are offset somewhat by increased benefits in developed and dispersed recreation.

Discounted costs decrease from \$149.4 million to \$133.8 million for a net reduction of \$15.6 million. The cost reductions associated with Alternative 6 occur as a result of the reduced timber and range programs. There are also cost reductions resulting from the wildlife and water programs. Some of these costs are offset by increased costs associated with that part of the increase in costs not related to higher recreation programs result from the following activities: trail, wilderness, recreation, fisheries, and insect and disease management.

#### Comparison, Alternative 6 and Alternative 8

Alternative 8 is the water augmentation alternative. Discounted benefits are \$18.1 million greater in Alternative 8 than in Alternative 6. This is a result of a \$12.3 million increase in timber benefits, a \$4.5 million increase in range, a \$2.1 million increase in wildlife benefits, and a \$1.2 million increase in water benefits. The benefits are slightly offset by reductions in developed and dispersed recreation outputs.

The net increase in discounted costs is \$19.4 for Alternative 8 above Alternative 6. There are slight cost reductions in recreation programs; however, costs associated with the timber, range, and wildlife programs heavily overshadow the reductions.

The reduction in PNV is \$1.3 million. Additional non-priced benefits associated with the added costs for this alternative result from soil and water improvements.

#### Comparison, Alternative 8 and Alternative 4

Alternative 4 is the non-market output alternative. Net discounted benefits decrease \$14.0 million from Alternative 8. This decrease is the result of a \$12.2 million drop in timber benefits, a \$4.4 million reduction in range benefits, a smaller decrease in wildlife and water benefits. These benefit reductions are offset somewhat by a benefit increase of \$4.8 million in developed recreation.

At the same time, discounted costs decrease \$11.4 million. The cost reductions associated with Alternative 4 occur as a result of reduced timber and range programs. Some of these costs are offset by increased costs associated with expanded developed recreation programs.

The combination of decreased benefits and increased costs results in a decrease in the PNV of Alternative 1 of \$5.8 million when compared to Alternative 8.

#### Comparison, Alternative 4 and 1

Alternative 1 is the Proposed Action alternative. Total discounted benefits increase \$12.6 million, from \$290.2 million to \$302.8 million above Alternative 4. This is due to a \$12.1 million increase in timber benefits, \$4.3 million in range, and smaller increases in wildlife and water. The increases are offset somewhat by decreases in developed and dispersed recreation benefits.

Discounted costs increase \$15.2, from \$141.8 million in Alternative 4 to \$157.0 million. Despite the cost reductions in recreation programs, costs associated with timber, range, and wildlife programs heavily overshadow these reductions.

Present net value decreases \$2.6 million to \$145.8 million in Alternative 1. This is a difference of \$57.8 million when compared to the maximum PNV benchmark alternative (BM3).

#### COMPARISON, ALTERNATIVE 1 AND ALTERNATIVE 3

Alternative 3 is the RPA alternative. Total discounted benefits are \$313.3 million, an increase of \$10.5 million over Alternative 1. Timber benefits increase \$3.1 million while developed recreation benefits increase \$6.1 million. Range and dispersed recreation benefits increase only slightly.

Discounted costs are \$172.4 million compared to \$157.0 million for Alternative 1. This is due primarily to an effort to meet the RPA specified outputs. The majority of the cost increases occur within the timber and developed recreation programs.

Overall, the incremental PNV is reduced \$4.9 million in Alternative 3 when compared to Alternative 1 and \$62.7 million when compared to the maximum PNV Benchmark alternative (BM 3).



### III. Affected Environment

## CHAPTER III AFFECTED ENVIRONMENT

### OVERVIEW

This chapter describes the environment affected by the alternatives displayed in Chapter II. This chapter describes the physical and biological setting; the economic and social setting; and provides a summary of the current situation and demand trends for the Forest resource and protection elements. This Chapter also describes in detail Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area.

### PHYSICAL AND BIOLOGICAL SETTING

The Forest's east boundary follows the Continental Divide and the Elk Mountains. The south boundary includes the northern slopes of the San Juan Mountains and the crest of the Wilson Mountains. The west and north boundaries are formed by the Uncompahgre Plateau and Battlement Mesa.

The Forest lies within the upper Colorado River drainage. Major rivers include the Gunnison, Uncompahgre, and San Miguel.

The planning area is located astride two physiographic provinces; Colorado Plateau and Southern Rocky Mountains. The two provinces differ greatly in landforms, rock types, and mineral deposits. Half of the planning area, within the Colorado Plateau Province, is characterized by high flat top mesas and rolling plateaus, sedimentary rocks, and mineral deposits including oil, natural gas, oil shale, coal, vanadium, and uranium. The other half of the planning area is characterized by rugged mountains, igneous rocks, and hardrock minerals including gold, silver, lead, zinc, copper, molybdenum, and uranium. Elevations range from about 6,000 feet to peaks over 14,000 feet.

The Forest is located within the Rocky Mountain Forest Eco-Region of the Highland Province, and includes four major climatic and vegetation zones; lower montane forest, upper montane forest, subalpine forest, and the alpine vegetation. Common vegetation types at the lower elevations include sagebrush, pinyon pine, juniper, Gambel oak, and ponderosa pine. Higher elevations include Engelmann spruce, subalpine fir, lodgepole pine, Douglas-fir, and quaking aspen. The major range types include the mountain meadow, mountain bunch grass, alpine meadow, and aspen-forb plant associations.

Much of the Forest is not in optimum growing condition. The lodgepole pine, Englemann spruce-subalpine fir and aspen types in particular tend to be overmature and therefore susceptible to losses from insect and disease infestations.

Unforested areas consist of grassland, brushland, and alpine communities. Grassland areas occur along streams and are often interspersed with forested areas. Sagebrush and oakbrush communities are common at elevations below the forested area while alpine communities predominate above timberline.

The various vegetation types provide habitat for a variety of game and non-game wildlife species. The more common species include mule deer, elk, black bear, blue grouse and ptarmigan, Gambel's quail, snowshoe hare, and cottontail rabbit. Bighorn sheep inhabit several areas of the Forest. Favorable habitat for the bald eagle and peregrine falcon exists in the planning area. Fisheries include cutthroat, rainbow, brook, mackinaw, and brown trout; kokanee salmon; northern pike; and white sucker.

#### VEGETATION

Forest vegetation contributes to Forest character more than most landscape features. Its form, color, and texture, is easily discernible to the human eye. Society perceives it to have beauty and utility.

The hundreds of individual plant species which occur on the Forest may be classified into less than a dozen vegetation types. Each type lends a unique character to the landscape and has an associated utility to society. Forest management is linked to vegetation treatment because vegetation influences other resource elements.

Vegetation is a dynamic resource. It will change over time. The way it will change is based on factors that effect the vegetation and the site on which it is growing. The Forest Reserves were established prior to 1900. Since that time Forest managers have largely controlled the factors that effect vegetation and growing conditions.

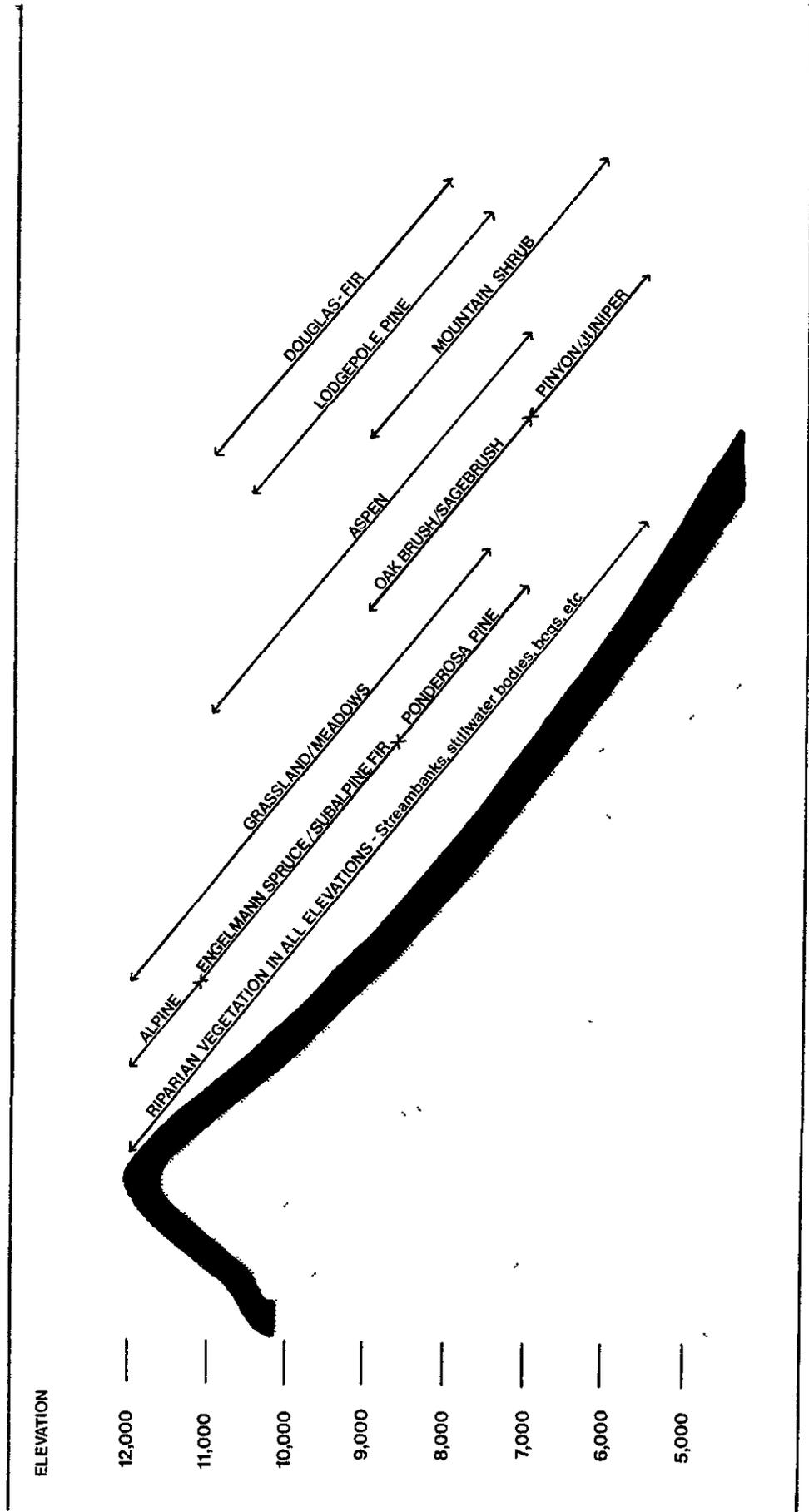
Forest managers control these conditions to provide and maintain a healthy, vigorous environment, capable of producing a range of outputs and conditions. There are consequences associated with not managing the vegetation on the forest. These consequences are discussed throughout Chapter IV.

A vegetation discussion of Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area is displayed in the Wilderness section of this chapter.

The following discussions display current condition, management needs, and expected forest condition without management. Figure III-1 displays elevation ranges for forest vegetation.

FIGURE III-1.

GENERAL ELEVATION RANGE FOR FOREST VEGETATION



## Alpine

Alpine vegetation grows above native tree elevation limits. It is characterized by grasses, grasslike forbs, low shrubs, and poorly formed trees. Alpine provides a unique opportunity for scenic viewing particularly during the early summer when wildflowers are in bloom. The most important factor controlling the distribution and growth of alpine plants is available soil moisture. The wildlife habitat provided by this type supports elk, bighorn sheep and mountain goats. Ptarmigan and pika are unique to the type. Livestock, particularly sheep, graze the alpine in designated range allotments.

Treatments which modify alpine vegetation are infrequently applied. Due to a short growing season and harsh climatic conditions, major disturbances of this vegetation type are very slow to recover. Alpine vegetation will perpetuate itself unless there is severe ground disturbance.

## Aspen

The aspen vegetation type occupies 17% of the Forest and typically occurs at lower elevations interspersed with grasslands, meadows, mountain brush, and other forest types. Aspen stands on the Forest are typically mature to overmature with high disease and mortality levels.

Aspen is important to recreation use. It is an important feature in the landscape character subtypes in the southern Rocky Mountain Physiographic province. Variety classes A and B have the highest visual quality on the forest. Aspen color and texture contribute to the character in many ways. These include edge contrast between aspen and conifer stands, aspen islands in large meadows, and massive textural blocks all occurring in the midground and background. In the foreground distance zone aspen form and texture are important features. Color is a dominant element in all distance zones. Color contrasts with surrounding coniferous vegetation, nonforest areas, bare rock, water and sky. The color change between seasons attracts many forest visits year round.

Mountain grasslands and associated aspen ranges furnish forage for a large segment of the livestock industry in Western Colorado. Many aspen sites support a luxuriant understory of forbs and grasses. These areas are important summer rangelands for both cattle and sheep. It is common to send 100 pound lambs directly to market at the end of the summer grazing season in early September.

The aspen ecosystem is important to Colorado wildlife. Deer and elk use aspen under 6 feet in height for forage. They use taller aspen for thermal and hiding cover. Aspen sprouts above snowcover are critical to winter diet in some areas. The grass, forb and shrub understory provide a summer food source as more forage is present than in conifer stands.

Aspen forests are prime elk calving and deer fawning habitat. This is especially true on south slopes within  $\frac{1}{4}$  mile of water between winter and summer range.

More songbirds are normally observed in aspen forests than in coniferous forests. Aspen provides food, nest sites, and cover for warblers, vireos, blue grouse, owls, thrushes, kinglets, and a variety of other birds. Small mammals such as shrews, moles and mice use aspen forests. Aspen understory and leaf litter provides their food, cover and nest sites. Aspen along riparian zones is the basic food for beaver.

Overmature aspen stands are usually decadent and provide cavities and insects for bird and mammal species. Aspen stands are usually in close proximity to conifer stands that can provide cover during aspen regeneration.

Aspen management in transitory big game range helps support the animals longer in the spring and fall. This takes pressure off summer and winter range and provides extra forage during mild winters.

Aspen regenerates almost exclusively through root sprouting. This results in clones which are genetically identical to the trees from which they originated. Trees within one clone are very homogeneous in such characteristics as rate of growth, form, vigor, resistance to disease, and time of leaf break and leaf fall. These characteristics often vary widely between clones due to genetic and site differences.

To stimulate root sprouting the majority of aspen clones require a major disturbance that results in the removal of most or all of the existing trees. Wildfire has historically been the primary disturbance initiating root sprouting. Control of wildfire has permitted many aspen stands to become overmature with no means of regenerating themselves. In the absence of, disturbance, either natural or man-made, much of the aspen will convert to conifer types in 100 to 200 years.

Resources will suffer if the aspen is not treated and allowed to convert to a conifer Forest. This will result in loss of the above described wildlife habitat conditions, reductions in forage supplies, and adverse impacts on the recreation settings associated with the aspen type. In order to maintain the aspen on the forest, 5,800 acres would have to be treated annually.

#### Douglas-fir

Douglas-fir occupies about 2 percent of the Forest. The Douglas-fir type is more important than its relative area implies. It typically occurs on steep, north-facing slopes at lower elevations and is frequently the only conifer vegetation in a large area. On south-facing slopes, Douglas-fir occurs sparsely on rocky ridges, steep hillsides, and canyon slopes.

Douglas-fir is a long-lived species which is valued for wildlife habitat diversity, scenic quality, and cover on big game winter range. Douglas-fir also contributes to watershed protection and is a desired commercial tree species. The Douglas-fir type has not been treated in the past resulting in mostly mature and overmature stands. Very little acreage of early successional stages of Douglas-fir are known to exist on the Forest.

Douglas-fir is a climax species that reproduces from seed. Without treatment stands mature and die but perpetuate the Douglas-fir type. Currently the stands have a relatively uniform age structure. Natural succession will perpetuate the current uniform distribution.

#### Gambel Oak

The oak brush vegetation type commonly occurs at lower elevations on the Forest. At its lower elevation range, it is frequently associated with pinyon-juniper trees. At its upper limit it is often interspersed with aspen, Douglas-fir, or ponderosa pine.

The Gambel oak type provides watershed protection, retards snowmelt, provides browse for wildlife and domestic stock, and is a popular firewood species. Gambel oak is capable of reaching tree size on some sites. This savannah type provides highly productive useable forage for wildlife and livestock. The mature trees provide cavities for small mammal dens and non-game bird nests. Food production for deer and turkey is highest on these sites. Gambel oak stands are often thick and animal mobility is severely restricted and the more palatable grasses and forbs are shaded out.

Currently, the majority of the Gambel oak type is estimated to be in an early seral stage. A more balanced structural distribution would improve this type for wildlife and domestic stock and increase the landscape's visual diversity.

#### Grasslands and Meadows

Grassland and meadow vegetation types occur throughout the Forest interspersed with all other vegetation types. Most grasslands support, or are capable of supporting, numerous kinds of perennial grasses and forbs. Herbage production on mountain grasslands occasionally exceeds 3,000 pounds per acre; however, yields of 1,000 to 2,000 pounds per acres are much more common.

Many of these open parks may be the result of fire. The forage produced in the grassland and meadow vegetation types is available for both wildlife and domestic stock. The open nature of these vegetation types provides a great deal of scenic variety. Management is typically directed at increasing forage while maintaining visual quality.

#### Lodgepole pine

Lodgepole pine occurs on the Forest primarily in even-aged stands of fire origin. Lodgepole pine is typically a seral species which, in the long-term absence of major disturbance, will be replaced by more shade-tolerant species--generally Engelmann spruce and subalpine fir. On some sites, however, where site conditions or lack of a seed source prevent the establishment of more tolerant species, lodgepole may form a virtual climax. The type occupies about 6 percent of the Forest and provides scenic beauty, wildlife habitat, firewood and other wood products.

Lodgepole pine is an aggressive pioneer into disturbed sites. Existing stands will deteriorate in 200 to 300 years. As lodgepole pine matures and loses vigor, it becomes highly susceptible to attack by the mountain pine beetle. Under the right stand conditions, individual beetle infestations multiply into an epidemic. The long-term solution to control pine beetle epidemics is to create a mosaic of age and size classes in lodgepole pine and to apply intermediate cultural treatments which promote vigorous, disease free trees. Mistletoe also heavily infects large amounts of lodgepole pine on the Forest. All of the suitable lodgepole pine stands occur on the Gunnison National Forest. Over 16,000 acres of stagnated lodgepole pine occurs on the Forest. Following disturbance, natural regeneration is often so prolific that the stand is overstocked and may become stagnated if it is not thinned. (Stagnation is a condition where competition between individual trees for light, water, and nutrients is so intense that growth ceases).

If lodgepole pine is not treated the even-aged stands will become overmature and the mountain pine beetle infestation risk will increase. The large areas of beetle killed trees will become increasingly susceptible to wildfire. If serotinous cones are present the lodgepole pine type could be maintained. Without a seed source meadows or other seral species such as aspen could invade burned over areas.

#### Mountain Shrub

This vegetation type is dominated by one or more of the following species: serviceberry, rabbitbrush, snowberry, and mountain-mahogany. It is located in combination with other brush types and some of the drier forest types. The primary value of the type is for wildlife habitat and domestic sheep range. It has particular importance when available for use as big game winter range. There is a significant imbalance in the structural stages with most of the type in intermediate and late stages on the Forest.

#### Pinyon/Juniper

This vegetation type is a scrub woodland composed of pinyon pine and juniper. It is a widespread type occurring below the elevation limit of Gambel oak and generally occupies the lowest elevations on the Forest.

The pinyon-juniper type occurs on the driest sites on the Forest and therefore is the least productive type. Vegetation is characterized by small size and low growth rate.

It provides forage for wildlife and livestock, adds scenic variety to the landscape, and furnishes products such as firewood, posts, and Christmas trees. It is important cover on big game winter range. Most of the type is estimated to be in the intermediate and late structural stages which reflects the lack of recent natural disturbance.

Many sites are grazed. This has destroyed much of the small sized understory. An estimated 10 percent is in an early seral stage in old chaining areas.

If left untreated the pinyon-juniper type will replace itself. If it replaces itself naturally the type will retain its current structural imbalance.

### Riparian

The riparian vegetation type is a plant association which occur in areas with year-round high water tables. Most of the distinct vegetation types on the Forest are represented in the riparian zone. In addition, the riparian includes willow, cottonwood and alder. These areas are typically located adjacent to streams and around springs, lakes, or bogs. While small in total area, they represent delicate, very important habitat for wildlife and serve as sediment traps to help purify overland water runoff. Desirable forage production is high, and under proper management these areas are an important part of grazing allotments. The riparian type also provides visual diversity and timber management potential along most forest streams. Riparian is important for recreation such as campgrounds and fishing. Riparian is one of the more productive sites on the forest. It also has the most uneven age structure.

### Sagebrush

This vegetation type occupies relatively dry sites on the Forest. It is typically found at lower elevations and is highly valued as big game winter range. It also provides a scenic desert-like landscape and significant forage for livestock. Most of the type is in intermediate and late structural stages. Management techniques used in this type are fertilization, prescribed burning, and mechanical or chemical treatment.

Sagebrush is an invader species that may eventually take over other sites. If left untreated the sagebrush type will perpetuate itself and expand.

### Engelmann Spruce/Subalpine Fir

Engelmann spruce and subalpine fir, occupies 17 percent of the Forest. This type occurs at high elevations and represents the climax on the majority of the sites it occupies. This type usually occupies moist sites. Spruce can grow to over 300 years and fir to 250 years. They generally occur in single age stands but occasionally occur in 2, 3, or multi-story stands. Its dense forest growth and layered appearance provides outstanding scenic views. It is also valued for wildlife habitat, watershed protection and production, and wood products.

There is currently a poor distribution of age classes or structural stages. This poor distribution is caused by low levels of management activity and by fire control. Sixty percent of the type is overmature. As the spruce and fir type matures, the trees become susceptible to insect and disease infestations. Subalpine fir is infected first, followed by spruce. A better balance of structural stages is needed to enhance forest health and vigor.

There was a massive spruce bark beetle epidemic during the period 1939 to 1952. It effected the old growth spruce and fir stands on the Forest at that time. Many of the dead trees are still standing.

The spruce/fir type reproduces by seed. It will reproduce itself naturally if not treated. The reproduction will retain the same age class distribution as currently exists. If a natural catastrophe occurs, such as a major fire, the site will probably revert to aspen or lodgepole pine.

#### Ponderosa Pine

This vegetation type occupies 7 percent of the Forest. It is located almost entirely on the Uncompahgre Plateau between 7,000 and 9,000 feet. Ponderosa Pine grows in pure stands, but can be associated with aspen and oakbrush. Ponderosa pine reproduces by seed. Natural regeneration requires the combination of a good seed crop, ample moisture the spring following seed fall to assure germination and seedling survival, and favorable seedbed conditions. These three conditions coincide rather infrequently. Historically, low-intensity wildfires burned through ponderosa pine stands at frequent intervals. These fires had little effect on established trees. Thick bark makes ponderosa pine fire resistant. However, these fires prevented the buildup of heavy duff accumulations and kept competing vegetation in check, thus maintaining seedbed conditions favorable to ponderosa pine. Fire suppression over the past several decades has resulted in a buildup of organic litter, making seedbed conditions less favorable for ponderosa pine. Currently the type is mature to overmature, open grown and poorly stocked. There are some uneven aged stands. These are the result of past cutting activity.

Ponderosa Pine is important for timber production, livestock grazing, and wildlife habitat. Elk calving areas can be located in this type at lower elevations.

Ponderosa pine is considered a climax species on many of the sites on which it occurs, particularly near the center of its elevational range. Major disturbances, such as high-intensity fires, heavy logging, or widespread mortality from insect or disease infestations may cause ponderosa pine sites to revert to more seral stages such as aspen, oakbrush or grass. The mountain pine beetle is currently at epidemic levels in some localized areas, but the rate of spread appears to generally be decreasing.

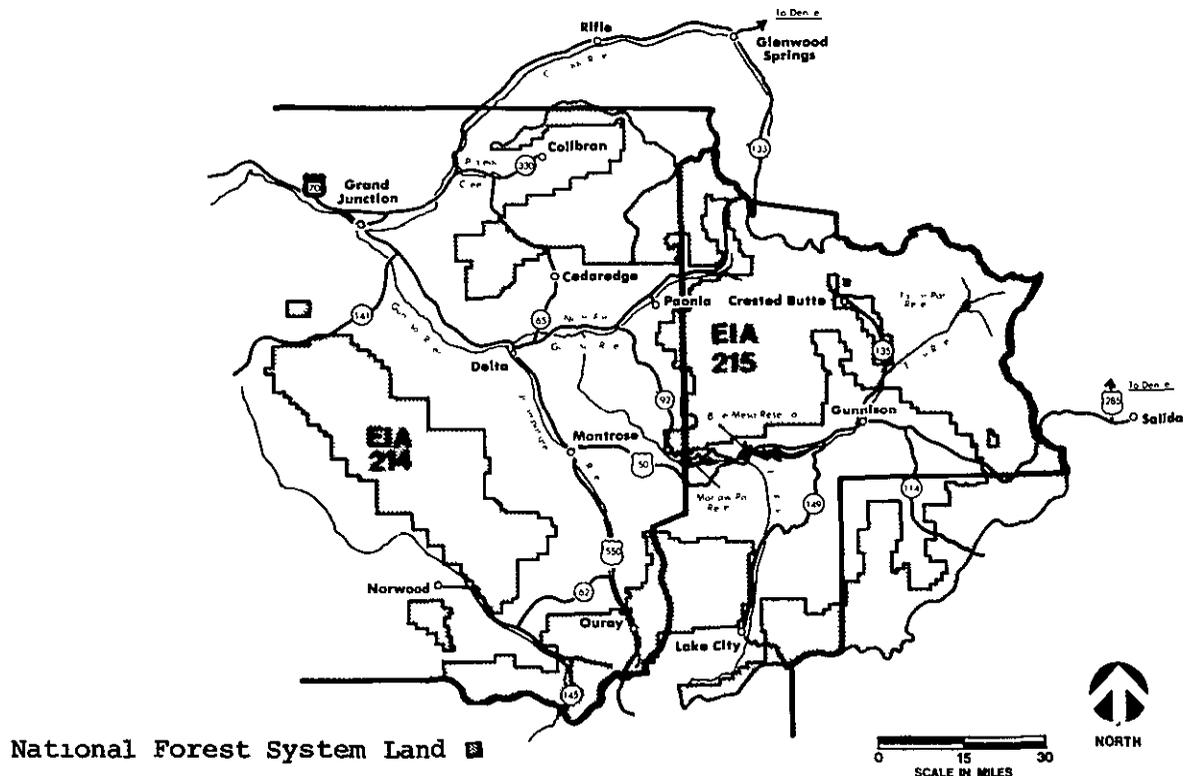
#### ECONOMIC SETTING

The Forest Planning Area contains portions of 4 Economic Impact Areas (EIA). These areas have been identified to define local economies within the Rocky Mountain Region which Forest Service management may effect. All outputs and effects for the Garfield county portion of the Grand Mesa Forest will be included in the White River National Forest planning process. Saguache County will be analyzed in the Rio Grande National Forest planning process. Figure III-2 displays the location of EIA's 214 and 215. These areas were used to conduct the economic impact analysis.

An economic setting discussion of Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area is displayed in the Wilderness section of this chapter.

FIGURE III-2.

### ECONOMIC IMPACT AREAS



### POPULATION

The planning area is separated from Colorado's front range population centers by the Continental Divide. Total population of the area is about 170,000 people. Population increased approximately 52,000 in the planning area between 1970 and 1980. This is a 43.63% increase and is higher than the state average. The growth rate is expected to remain strong over the planning horizon. Table III-1 displays the population projections for the planning area.

Some commentators felt the growth projections displayed in the Draft EIS were too high. The growth rate displayed in Table III-1 has been revised to reflect current census data.

TABLE III-1.

POPULATION  
(Percent Change and Thousand People)

County	Actual Population*		Percent* Change	Projections at Same Range of Change**				
	1970	1980		1990	2000	2010	2020	2030
Delta	15.3	21.2	38.6	34.8	38.3	40.1	41.8	43.5
Garfield	14.8	22.5	52.0	36.0	40.5	44.5	46.5	48.5
Gunnison	7.6	10.7	40.8	19.1	22.3	23.9	25.5	27.1
Hinsdale	.2	.4	100.0	.6	.7	.8	.9	1.0
Mesa	54.4	81.5	49.8	94.9	110.6	128.3	148.9	172.7
Montrose	18.4	24.4	32.6	36.4	44.9	49.1	53.3	57.5
Ouray	1.5	1.9	26.7	2.0	1.9	1.9	1.9	2.0
Saguache	3.8	3.9	2.6	4.0	4.2	4.3	4.4	4.5
San Miguel	1.9	3.2	68.4	5.0	5.9	7.9	8.9	10.0
San Juan	.8	.8	.0	.8	.8	.8	.8	.8
<b>TOTAL</b>	<b>118.7</b>	<b>170.5</b>		<b>233.6</b>	<b>271.1</b>	<b>301.6</b>	<b>332.9</b>	<b>367.6</b>

Source: \* 1980 Colorado Population Reports, Bureau of the Census and Planning Records.

\*\* June 1982, strict ratio method applying 1980 census material to 1979 projection.  
State Demographer's Office, Department of Local Affairs. (Projection beyond  
2000 were calculated using trend line analysis.)

EMPLOYMENT AND INCOME

The average per capita income for the ten county area in 1977 was \$5,789. By 1979 it had risen to \$7,423. Table III-2 displays the number of jobs, the workforce unemployment rate, and the total income in 1979 by EIA.

TABLE III-2.

EMPLOYMENT AND INCOME\*

	Unit of Measure**	Economic Impact Area	
		214	215
Income			
Employee Compensation	MM\$	363.1	28.5
Property	MM\$	252.0	21.1
Total Income	MM\$	615.1	49.6
Employment	M Jobs	30.85	2.24
Workforce Un- Employment Rate	%	4.8	3.9

\*\* MM\$ = Million Dollars  
 M Jobs = Thousand Jobs  
 % = Percent

Unemployment in 1980 was low in all counties except Ouray, where unemployment was 9%. The projected unemployment rate through May 1981 increased to the point that Delta, Ouray, and San Miguel Counties are designated as labor surplus areas.\*\*\* This is due to the depressed uranium prices and mine closings.

The total average monthly labor force in the ten county area for 1980 was estimated to be 80,960; of which 77,789 were employed. The unemployment rate for 1980 was 3.9%. The state average was 3.6% at this time. About 14% of this employment (10,900 jobs) are directly, indirectly, or induced by activities on the Forest. Table III-3 displays the 1980 direct employment influence of the Forest.

Source: \* IMPLAN, Rocky Mountain Region, Input/Output Model.  
 \*\*\* Colorado Manpower Review - Vol. XVII, No. 7, July 1980.

TABLE III-3.

EMPLOYMENT INFLUENCE OF THE FOREST 1980  
(Jobs)

Activity	Jobs
Recreation (Downhill Skiing Areas)	5,400
Recreation (Fishing & Hunting)	2,200
Agriculture (Livestock)	1,100
Logging/Sawmills/Wood Products (Timber)	600
Recreation (Other)	1,600
TOTAL	10,900

## EXPENDITURES AND RETURNS

Budget Expenditures - The fiscal year 1981 Forest budget was 6.3 million, 1978 dollars, including capital investment. Table III-4 displays a general classification for the 1981 budget.

TABLE III-4.

FISCAL YEAR 1981 BUDGET  
(Thousand, 1978 Dollars)

Budget Item	Funding Level
Capital Investment	355.0
Backlog	369.6
Total Appropriation	5,759.8
Allocated Funds	554.8
TOTAL	6,314.6

Payments to Counties - Each year, 25 percent of the receipts from Forest outputs goes to the State for distribution to counties in which the forest is located. In 1982, about \$304,000 was paid to the 10 counties in the Forest Planning Area from the National Forest Fund Receipts program. The following components comprise the receipts that make up the "25% Fund":

- Gross receipts from timber harvested
- Land use permits
- Recreation permits
- Mineral permits
- Recreation user fees
- Grazing fees

In addition to the above, payments in lieu of taxes are authorized to the counties under one of two options based on the number of "entitlement land" acres, but not for tax exempt lands (but not donated lands) acquired from State or local governments. The amount paid is the higher of (A) 75 cents for entitlement land acres within the county's boundaries, reduced by the amount of certain Federal payments that were received by the county in the preceding fiscal year, or (B) 10 cents for each entitlement land acre within the county, not reduced for Federal land payments received in the preceding fiscal year. Both options are subject to a ceiling based on the population of the county. This ceiling is based on a sliding scale, starting at \$50 per capita for populations up to 5,000 and rising to a maximum of \$1,000,000 (\$20.00 per capita for populations up to 50,000). Under the Option A, if the total calculated payment (75 cents/acre) exceeds the ceiling, the deductions for other Federal land payments received are taken from the ceiling, not the 75 cents per acre figure.

In 1981 the Forest paid a total of \$273,000 to the counties in the Forest Planning Area under the 1976 Payment in Lieu of Taxes Act (Public Law 94-565).

Returns to the U.S. Treasury - Each year the Forest returns money to the U.S. Treasury. The amount returned is the total dollars received from all revenue-producing activities conducted on the Forest. In 1981 the Forest returned \$879,000 to the U.S. Treasury.

## SOCIAL SETTING

### SOCIAL RESOURCE UNITS

The Forest Service has sub-divided the Rocky Mountain Region into Social Resource Unit's (SRU). Social Resource Unit's are a framework for assessing social, cultural, and economic interactions with the physical resources. Social Resource Unit's are homogeneous in terms of settlement patterns and natural barriers that separate the area from other areas in Colorado. The Forest is entirely within Social Resource Unit H.\*

Source: \* Final Rocky Mountain Regional Guide

This unit is defined by the Continental Divide to the east and the San Juan Mountains Range on the south. The Utah desert isolates the SRU from other units to the west. To the north, the Battlement Mesa Divide and the Mesa-Garfield county line separate SRU H from SRU G.

Millions of people use the Forest annually. Visual quality, a pleasant recreation experience, camping, boating, the opportunity to view and hunt wildlife, and to hike in wilderness all contribute to the Forest's attraction. The attraction is based mostly on the natural environment. The effect of Forest management is to support that natural environment. The major tool the Forest Service has in providing and enhancing these types of experiences is vegetation management.

A social setting discussion of Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area is displayed in the Wilderness section of this chapter.

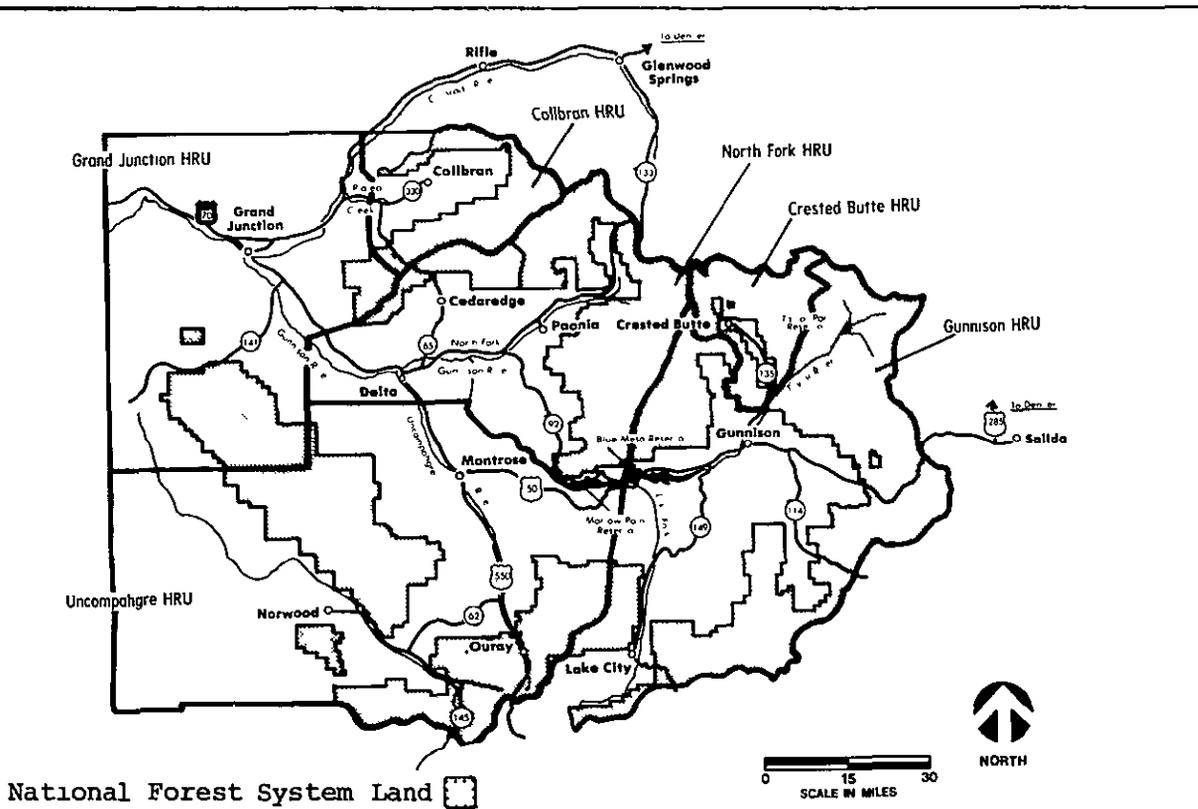
#### HUMAN RESOURCE UNITS

The Forest has delineated six smaller units within SRU H. These are called Human Resource Units (HRU). Human Resource Units are used to design management actions that respond to changing conditions at the Forest and Ranger District level. An HRU is a geographic area characterized by particular lifestyles, economic conditions, institutional arrangements, and topography. HRU's vary in size but are typically larger than individual towns and communities, and they may cross political jurisdictions. The Collbran, Crested Butte, Grand Junction, Gunnison, North Fork, and Uncompahgre HRU's were identified to help design management actions that would be responsive to local issues, conditions, and needs.

The following discussion briefly describes each HRU. General location; settlement; lifestyles; attitudes, beliefs, and values; social organization; and population and land use are described. Figure III-3 displays the location of the six HRU's.

FIGURE III-3.

HUMAN RESOURCE UNITS



Collbran Human Resource Unit

The Collbran HRU is located in the east part of Mesa County known as the "Plateau Valley". Its boundary on the north is the Battlement Mesa divide, on the east Plateau Valley watershed divide with Divide Creek watershed, and on the south Mesa County line. The west boundary is a line between the Grand Valley and Plateau Valley. Considerable public interaction exists across this boundary with the Grand Junction Human Resource Unit.

This area was settled in the 1880's by farmers and ranchers. These land use patterns still exist today. Some homesteads have been abandoned, others have consolidated ownership. Ranching is still a basic industry in the area.

Some diversity is generated by the Vega State Recreation Area and Powderhorn Ski Area. The downhill ski industry was established at Powderhorn in 1966.

Lifestyles - Ranching is dependent on the National Forest System for livestock grazing. The water resource has been extensively developed in the past for irrigation use. Tourism is a significant employer. Tourists are attracted by recreation opportunities including big game hunting, fishing, and downhill skiing primarily on National Forest System land. Downhill skiing is centered around the day use Powderhorn Ski Area. Oil and gas exploration personnel work in the HRU on a seasonal basis.

Attitudes, Beliefs, and Values - This unit is ranching oriented. Interest and concern about land and resource management, especially water and grazing, is high. Public issues were raised opposed to additional wilderness designation or additional road construction.

Social Organization - The Collbran HRU is rural and sparsely settled. Limited fire, law enforcement, search and rescue, medical, local news media, and local planning services are available in the area. Education through high school is available. Most residences travel outside the unit, to Grand Junction, for the majority of their purchases.

Population and Land Use - Agriculture continues to be a dominant land use. Private land holdings within the Forest are used primarily for ranching and grazing. There is local speculation that oil shale development may effect population and current land uses. The 1980 census shows a 30% growth rate for the Collbran division of Mesa County for the period 1970 to 1980.

Social Change - Some significant social change may take place in this HRU regardless of Forest Service action. These changes are due to energy and minerals development. Primarily oil and gas and oil shale development.

#### Crested Butte Human Resource Unit

The Crested Butte HRU is located in the north central part of Gunnison County where the Elk Mountain Range forms the Forest and County boundary. It is essentially the East River drainage including Ohio Creek and part of the Spring Creek drainage.

Prior to 1860, the county was unexplored and used as a summer hunting ground by the Ute Indians. In 1861 gold was discovered in Washington Gulch. In 1872 silver was discovered in the Elk Mountains. The area has a history of gold, silver, and coal mining. The railroad arrived in 1881. In 1952 the last coal mine closed and railroad service ended. The area was revived in 1964 with the development of a downhill ski area. This has established a new economic base for the HRU. By the early 1970's it brought new prosperity to Crested Butte. The resort community of Mount Crested Butte has formed at the Crested Butte Ski Area.

Mining could become a significant element in this HRU. Exploration for the proposed Mount Emmons mining project began in 1974. The company has discovered a large molybdenum deposit in Mount Emmons.\*

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Source: \*Mount Emmons Mining Project, Final EIS, October 1982.

Lifestyles - Ranching and tourism are dependent on National Forest System land. Summer recreation emphasized fishing, boating, picnicking, and camping. Four-wheel drives are popular. Downhill skiing is centered at Crested Butte. Cross-country skiing and snowmobiling occurs throughout the high country surrounding Crested Butte. The water resource is important for irrigation, snow making, and domestic use.

Attitudes, Beliefs, and Values - Public issues indicate local opposition to minerals development and the effect growth will have on water quality and big game population.

Social Organization - The Crested Butte HRU is a rural unit centered around the ski area. Limited fire, law enforcement, search and rescue, medical, local news media, local planning, and commercial trade services are available. Education is available through high school. Most residents travel outside the unit for major purchases.

Population and Land Use - Crested Butte is one of the most sparsely populated HRU's surrounding the Forest. The population is located around Crested Butte and Mount Crested Butte.

Continued rapid growth is expected if the proposed Mount Emmons Mining Project starts. Much of this activity will occur around Gunnison in the adjacent HRU. The 1980 census shows a 237% growth for the Crested Butte division of Gunnison County for the period 1970 to 1980.

Social Change - Some significant social change may take place in this HRU regardless of Forest Service action. These changes are due to minerals development.

#### Grand Junction Human Resource Unit

The Grand Junction HRU is located at the confluence of the Gunnison and Colorado Rivers. The south border follows the Mesa-Delta County line to the point where the boundary changes to the Mesa-Montrose County line to the State line (omitting the Manti-LaSal National Forest). The west boundary follows the State line to the Mesa-Garfield County line. The north boundary follows the Mesa-Garfield County line. The east boundary is a line between the Grand Valley and Plateau Valley. Considerable public interaction exists across this boundary with the Collbran HRU.

The original settlers migrated in the 1880's from the east into the Colorado and Gunnison River Valleys. Water, climate, and protection provided by the surrounding mountains and plateaus helped establish the farming and ranching industry. The railroad was extended from Denver and Salt Lake City to the Grand Valley in the 1880's. This turned the area into a major distribution center by the turn of the century. This increased the market for agricultural production and the need for more workers.

Lifestyles - Support services and light industry are the major employers in the area. The population is in the middle to slightly younger age group. A secondary employer is ranching and farming. The Forest's water resource is important for irrigation and domestic use. Summer recreation focuses on fishing, camping, four-wheel driving, hiking, and other opportunities on National Forest System land.

Attitudes, Beliefs, and Values - This unit is being urbanized. Public issues indicate concern for continued opportunity for camping, fishing, snowmobiling, and cross-country skiing. Issues were also raised concerning water and mineral development on grazing and wildlife. Interest in land and resource management is high.

Social Organization - Full service fire, law enforcement, search and rescue, medical, news media, planning, and commercial trade services are available. Elementary and secondary school education is available through high school. Mesa College provides opportunity for higher education.

Population and Land Use - Grand Junction is an urban area rapidly engulfing the surrounding communities. Growth patterns radiate out from the city center along Highway 6 toward Palisade, west toward Fruita, and south along Highway 50 toward Whitewater. The 1980 census recorded a 50% growth rate for the period 1970 to 1980. This is the most densely populated HRU in SRU "H" and includes approximately one-half of its population.

Social Change - Some significant social change may take place in this HRU regardless of Forest Service action. These changes are due to energy and minerals development.

#### Gunnison Human Resource Unit

The Gunnison HRU contains most of Gunnison County. Its east and south boundary is the Continental Divide. From a point near Lake City the boundary runs north along the Uncompahgre HRU boundary through the Big Blue Wilderness to the Gunnison River near Blue Mesa Dam. The boundary continues east through the West Elk Wilderness to Purple Mountain and the East River drainage. The north boundary follows the divide between the White River and the Gunnison National Forest.

Settlement at Lake City began when gold and silver were discovered. In 1877, it was unrivaled in population and size on the Colorado West slope. Lake City was a supply point for Animas Forks, Silverton, Ouray, Mineral City, Capitol City, and other smaller San Juan mining camps. Gunnison was incorporated in 1875. In 1881, the Denver and Rio Grande Railroad reached Gunnison. Sargents, Doyleville, and Parlin located along the tracks.

Railroad spurs were built to Crested Butte in 1881 and Lake City in 1889. Mining declined near the turn of the century and the Gunnison area economy changed from mining to logging, farming, ranching, railroad support, and light industry.

Lifestyles - The majority of the work force is employed in retail trade, tourist related business, agriculture, logging, and education (Western State College). Water is important for irrigation, boating, and domestic use. Hunting and fishing are major recreation activities. Recreation visitors provide significant Forest use within the HRU and provide significant impact on the economy.

Attitudes, Beliefs, and Values - Interest and concern in land and resource management is high. The public has a wide spread concern over water use, grazing, wildlife, and preservation of the area in its natural state. The Lake City economy is seasonal and the public believes industrial growth is needed to enhance community growth and stability. Public issues were raised opposed to and supporting additional wilderness designation.

Social Organization - The Gunnison HRU is a large mostly rural unit. Full service fire, law enforcement, search and rescue, medical, news media, planning and commercial trade services are available in Gunnison. Limited services are available elsewhere in the unit. Elementary and secondary school education is available through high school. Western State College provides opportunity for higher education.

Population and Land Use - Ranching and tourism are the dominant land uses. If the proposed Mount Emmons Mining Project begins, employment opportunities will be available in the mining industry, and mining would become a significant economic factor and land use. The 1980 census records a 41% growth rate for Gunnison County for the period 1970 to 1980.

Social Change - Some significant social change may take place in this HRU regardless of Forest Service action. These changes are due to minerals development.

#### North Fork Human Resource Unit

The North Fork HRU includes Delta, Gunnison, and Montrose Counties. It includes the North Fork of the Gunnison River and part of the Gunnison River. Its boundary on the west and north is the Mesa-Delta County line. On the east it is the Raggeds and Ruby Mountain ranges and the Paonia-Taylor River Ranger District boundary line through the West Elk Wilderness. The south boundary includes the Gunnison River and the Montrose-Delta County line.

The earliest settlement in the North Fork HRU occurred in the early 1880's and became the basis of a new irrigated agriculture economy. Ranchers, farmers, and fruit growers moved into the area to help support the local mining industry. Railroads linked the area with the east and west. The mining industry developed the coal deposits in the North Fork Area.

The mining industry decline in the early 1900's forced residents from the mountain communities to the Delta-Cedaredge area. Through the 1930's, agriculture continued to be the leading income source.

Lifestyles - Ranching, farming, fruit growing, and coal mining are the major industries of the area. Ranchers, farmers, and fruit growers have interests in National Forest System management as it effects water, grazing permits, demand for farm land for other uses and property values. The ranching industry depends heavily on National Forest System for livestock grazing. Water has been extensively developed in the past and is an important resource to the ranching, farming, and fruit growing industries.

Seasonal employment makes up a substantial portion of the agricultural employment. The fruit growing industry hires many migrant workers each season.

Timber is not a major industry in the HRU, however there remains a steady demand for timber products. Eleven percent of the timber volume sold by the Forest is processed at mills in the HRU.

A large percentage of the farmers and ranchers also hold jobs at the coal mines. Most farms and ranches are too small to be self-sufficient. These workers may spend their vacations and weekends working on their farms and ranches. Mine shutdown programs put all employees on vacation at one time.

Forest land within this HRU receives considerable outdoor recreation use. Many recreationists come from the Denver area. The major summer recreation activities are water related. About half of the 103 lakes on Grand Mesa lie within the HRU. Island Lake, Ward Lake, and Crawford and Paonia Reservoirs are the most popular. There are a large number of private summer home developments around many of the lakes on the Grand Mesa.

Attitudes, Belief, and Values - There are two resident groups in this HRU. The first group are the ranchers, farmers, fruit growers, and miners. They value the agricultural lifestyle and available open space. Public issues indicate these residents do not want change. The second group are new miners, retired people, and businessmen that recently arrived in the area. They tend to support growth and diversity.

Social Organization - The North Fork HRU is rural. Full service fire, law enforcement, search and rescue, medical, news media, planning, and commercial trade services are available in Cedaredge, Crawford, Delta, Hotchkiss, and Paonia. Education is available through high school. A vocational school in Delta provides the opportunity for trade education. Many residents travel outside the unit to Montrose and Grand Junction for major purchases.

Population and Land Use - Agriculture continues to be the dominant land use in the HRU. Private land within the National Forest is used primarily for ranching and grazing. The 1980 census shows a 39% growth rate for Delta county for the period 1970 to 1980.

The Cedaredge-Orchard City area is presently growing at a faster rate than the county. Twelve new subdivisions have been annexed in the last ten years. The 1980 census shows a 70% rate for this area for the period 1970 to 1980. Approximately 50% of the new residents arrive from outside the region. Agricultural land east and south of Delta is being developed for residential use.

Social Change - Some significant social change may take place in this HRU regardless of Forest Service action. These changes are due to energy and minerals development, primarily coal mining.

#### Uncompahgre Human Resource Unit

The Uncompahgre HRU includes the Uncompahgre and San Miguel River drainages. The west boundary is the Colorado-Utah State line. The north boundary follows the Delta-Montrose County line and the Gunnison River to a point near the Blue Mesa Dam. The boundary continues south across private and BLM land, along a

divide to the Hinsdale-Ouray County line in the Big Blue Wilderness. On the south the boundary follows the Uncompahgre-San Juan National Forest boundary and the San Miguel-Dolores County line to the Colorado-Utah State line.

The earliest settlers were the Ute Indians. They are the only tribe indigenous to the basin. The first white settlers arrived in 1874. Fort Crawford was constructed for their protection. Settlement began in the mining areas in the San Juan Mountains. These communities included Ouray and Telluride. Many other towns were developed near the mining areas, but were deserted when the mineral resources were depleted. Montrose grew as a trade center. It continued to prosper after the mining decline. Commercial development in Montrose follows U.S. Highways 50 and 550.

In the 1960's, recreation stimulated interest in the old mining communities at Ouray and Telluride. Growth is steady and the demand for land continues to increase real estate prices.

The Uranium Mine in Uravan revitalized the Norwood/Naturita area in the 1970's.

Lifestyles - The majority of the labor force is employed in retail and wholesale trade and government. Skilled trades and professional personnel make up a large part of this group. Most employment is located near Montrose. Although timber is not a major industry in this HRU, there remains a steady demand for timber products. Sixty-three percent of the timber volume sold by the Forest is milled in Montrose.

A labor force is centered around the recreation use of the Uncompahgre National Forest near Telluride and Ouray; and the Black Canyon of the Gunnison National Monument. Telluride is a major destination ski resort. Ouray bills itself as the "Little Switzerland" a major summer resort area. A jeep tour business with national importance exists between Ouray and Telluride.

The HRU offers year round recreation opportunities. Summer recreation emphasizes camping, backpacking, sightseeing, fishing, boating, and picnicking. High use areas include the Uncompahgre Plateau, Miramonte Reservoir, Silver Jack Reservoir, and the Black Canyon of the Gunnison National Monument. Three wilderness areas are located in the unit. The area is highly accessible in the summer months, especially to off-road vehicles. Heavy winter snow provides good downhill skiing at Telluride.

Attitudes, Beliefs, and Values - The attitudes and beliefs of the public in the HRU are diverse. The attitudes of the mining industry are different from those of the downhill ski industry. The attitudes of the agricultural community are different from those of the recreationist. The retired public voices a strong opinion concerning land use. Issues show concern for grazing, wildlife, watershed, skiing, four-wheel driving opportunities, and orderly development.

Social Organization - The Uncompahgre HRU is a mostly rural unit. Montrose is the commercial center for the unit. Limited to full fire, law enforcement, search and rescue, medical, news media, planning, and commercial trade services are available in Montrose, Norwood, Ouray, and Telluride. Education is available through high school.

Population and Land Use - The Uncompahgre HRU contains a number of smaller communities. The Montrose-Olathe area is the regional center. It contains the largest portion of the population. Initially the economy revolved around agriculture. Now it is diversifying its economic base to include light industry, tourism, and agriculture. There is a substantial population of retired residents who have moved to the area because of its stability and unpolluted natural resources. The 1980 census shows 40% growth rate for the period 1970 to 1980.

The Norwood, Naturita, and Nucla area is isolated from the populated area. This area is primarily mining oriented. The depressed uranium market has affected this area to the point that several mills have closed. The communities are anxious to strengthen and diversify their economy. The 1980 census shows an 8% growth rate for the period 1970 to 1980.

The Telluride and Ouray area is also isolated from the populated area. This area is primarily mining and tourism orientated. Telluride has a large development potential related to the Telluride Ski Area expansion. The 1980 census shows 50% growth rate for the period 1970 to 1980.

Social Change - Some significant social change may take place in the HRU regardless of Forest Service action. These changes are due to energy and minerals development. Primarily coal, gold, silver, and molybdenum mining.

#### RESOURCE ELEMENTS

The following describe the resource and support elements managed by the Forest. These are the same elements used in the 1974 Forest and Rangeland Renewable Resources Planning Act.

The following discussion displays the current management situation. It must be remembered that the Forest is managed on an integrated basis. Management decisions effect all resources. These effects are designed to achieve multiple resource objectives.

Management activities affect a variety of resources, and decisions are made only after considering the entire set of ramifications involved. Similarly, single management activities are actually designed to serve a variety of resource objectives. For example, treating lodgepole pine stands with small clearcuts to increase water yield will provide additional wildlife habitat and a wood source for various purposes. Water developments are designed to serve the needs of certain wildlife species as well as domestic livestock. Roads are located to efficiently transport logs from a timber sale area to the mill, but these same roads are also designed to provide access for hunting, firewood gathering, and other recreation activities.

Other inter-relationships are more separated chronologically. For example, treating trees to improve successional vegetation stages can provide an immediate timber benefit and will eventually improve wildlife habitat and visual quality. Improved diversity leads to a gradual increase in populations of certain animal species, which in turn increases recreation opportunities for viewing, photographing, and hunting these animals. This series of events may take several years to come to fruition, yet it may be entirely the result of a single management activity.

Resources are part of a very complex system with numerous interactions. They are described individually only to emphasize important aspects of the current situation in some type of organized framework. These elements must be conceptually combined in order to understand the overall current situation on the Forest.

## RECREATION

Recreation is a major Forest use. An estimated 2.2 million recreation visitor days (RVD's) were recorded in 1980.

The 1981 Colorado Outdoor Recreation Plan (SCORP) identified three recreation activities that the Forest Service in the Region 10 Planning Area should provide additional opportunities for. These are picnicking, four-wheeling and downhill skiing.

A recreation discussion of Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area is displayed in the Wilderness section of this chapter.

### Developed Recreation

Current Use and Management - Existing developed recreation sites on the Forest include: 5 observation sites, 67 family campgrounds, 11 family picnic grounds, 2 group picnic grounds, 2 organization camps, 5 privately owned resorts, 3 concession sites, 2 information sites, and 12 recreation residence sites. These developed recreation sites can support approximately 744,000 RVD's. There are a few private campgrounds near the Forest. Approximately 80% of the developed recreation use occurs at recreation sites on the Forest.

Use in 1980 of National Forest System developed recreation sites was approximately 578,000 RVD's annually. Some sites are more popular and receive more use than others. Currently developed recreation demand exceeds capacity on the Grand Mesa and along Taylor River. Over the last ten years, developed use has increased from 46% to 82% of capacity. Use in the private sector has increased at a greater rate than the public sector.

Demand Trends - Demand is increasing for all types of developed recreation. National Forest System developed recreation use is increasing at approximately 2.7% per year. At this rate demand for National Forest System developed recreation will exceed supply after 1990. Table III-5 displays average annual developed recreation demand for the 50-year planning horizon.

There are more than enough potential development sites to meet demand through 2030, if enough budget were available to construct the necessary new sites and it was a goal of the Forest.

TABLE III-5.

DEVELOPED RECREATION DEMAND  
(Thousand RVD's Per Year Excluding Downhill Skiing)

	Time Period					
	1981-1985	1986-1990	1991-2000	2001-2010	2011-2020	2021-2030
Developed Recreation Demand	617	695	812	968	1,124	1,280

Downhill Skiing

Current Use and Management - The three downhill ski areas on the Forest supported 222,000 RVD's during the 1980 season. Capacity in 1980 on the three ski areas was 737,592 RVD's. Table III-6 displays the existing and potential capacities for the three ski areas and the possible Monarch Ski Area expansion onto the Forest. The ski areas have a potential capacity of 3.04 million RVD's. Crested Butte, Powderhorn, and Telluride have approved master plans. The Crested Butte master plan includes expansion onto Snodgrass.

Demand Trends - Demand for downhill skiing has increased. With the projected annual growth rate of 8.4%, downhill skiing use will account for 50% of the Forest's developed recreation use by the year 2010. Downhill skiing use is expected to reach 1,063,000 RVD's annually by year 2030. Crested Butte, the Monarch expansion, Powderhorn, and Telluride have potential capacity to supply downhill skiing opportunities to meet projected demand through 2030. Table III-7 displays the average annual demand for downhill skiing on the Forest.

In comments on the Draft EIS the High Country Citizens' Alliance stated, "The Plan projects a quadrupling of downhill skiing through the year 2030. There are indications that for reasons of economics and demographics, downhill skiing may be approaching its peak of popularity. Neither the Plan nor the EIS offer any analysis or references to support this growth assumption."

Demand projections were developed using trend line analysis. As additional data becomes available demand projections may be revised.

TABLE III-6.

## DOWNHILL SKI AREA CAPACITY\*\*

Area	Existing Capacity		Total Approved Master Plan Capacity		Potential Capacity	
	PAOT*	RVD*	PAOT*	RVD*	PAOT*	RVD*
Crested Butte	4,050	341,717	10,700	902,812	10,700	902,812
Monarch	0	0	0	0	5,400	437,500
Powderhorn	1,800	147,375	4,500	368,438	4,500	368,438
Telluride	2,800	248,500	15,000	1,331,250	15,000	1,331,250
<b>TOTAL</b>	<b>8,650</b>	<b>737,592</b>	<b>30,200</b>	<b>2,602,500</b>	<b>35,600</b>	<b>3,040,000</b>

\* PAOT = People at one time.  
RVD = Recreation visitor days.

\*\* The existing Monarch Ski Area is on the San Isabel National Forest. It could potentially expand onto the Forest. The figures represented here exclude the San Isabel capacity.

TABLE III-7.

DOWNHILL SKIING DEMAND  
(Thousand RVD's Per Year)

	Time Period					
	1981-1985	1986-1990	1991-2000	2001-2010	2011-2020	2021-2030
Downhill Skiing Demand	269	362	502	689	876	1,062

The Forest retains downhill skiing opportunities on eight potential sites by utilizing management activities compatible with their long-term future as downhill ski areas. Existing area expansion is encouraged over new site development. The Forest does not actively encourage new development, but responds to proponent interest on an individual basis. Table III-8 displays the potential ski sites using the four-level Priority System disclosed in the Regional Guide. This priority system facilitates land management allocation decisions and guides development scheduling of allocated winter sport sites.

TABLE III-8.

POTENTIAL SKI SITES\*

Area	Regional Priority*
Mt. Axtell (Gibson Ridge)	1
Salt Creek	2
Wilson Ridge	2
Carbon Peak	3
Double Top	3
Rambouillet - Slunguillon	3
Twin Peaks	4
Park Cone Mountain	4

Dispersed Recreation

Current Use and Management - The Forest provides opportunities for a wide variety of dispersed recreation activities. Total dispersed recreation capacity is approximately 10.2 million RVD's annually. The Forest can supply 847,560 RVD's of semi-primitive non-motorized recreation use and 2,637,154 RVD's of semi-primitive motorized recreation use each year.

These supplies are taken from the existing Recreation Opportunity Spectrum (ROS) Class calculations and are assumed to be constant for the 50-year planning horizon. Some increase in capacity would be created with the addition of access required for vegetation treatment during this time. However, this increase is figured to be less than 10%.

Dispersed recreation use for 1980 was 1.2 million RVD's. Most use occurs along and adjacent to roads. Non-motorized use is expected to increase faster than motorized use. The current use by ROS class is displayed in Table III-9. Current acres by ROS class are displayed in Figure III-4.

Source: \* Final Rocky Mountain Regional Guide.

TABLE III-9.

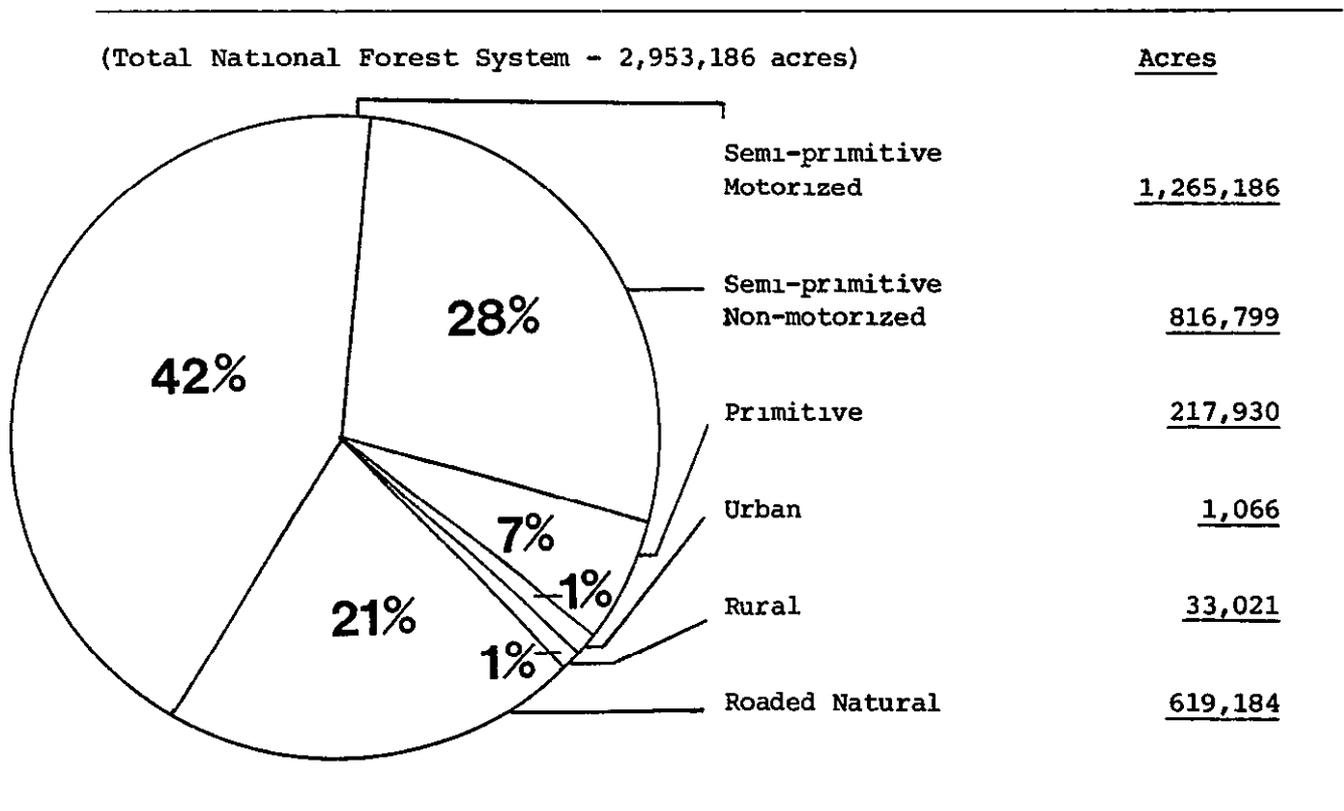
1980 RECREATION USE SUMMARY

ROS* Class	RVD's**
Urban, Rural and Roaded Natural	696,300
Semi-Primitive Motorized	492,900
Semi-Primitive Non-motorized	45,500
<u>TOTAL</u>	<u>1,234,700</u>

\*\*RVD's = Recreation Visitor Days.

FIGURE III-4.

CURRENT ROS\* DISTRIBUTION



\*ROS = Recreation Opportunity Spectrum

About 125 permits are issued annually for outfitters and guides on the Forest. Outfitting for big game hunting is the predominant activity. This is considered a dependent industry with Forest use essential to its survival. The Forest manages these permits in accordance with the Forest Service Manual and the Forest's Interim Outfitter Guide Policy. New national policy is being developed. When adopted the Forest policy will be modified to be in conformance.

Current direction will increase opportunities for motorized recreation. However, some roads are closed or their use restricted to protect resource values, reduce maintenance budget requirements and to meet other resource objectives. A discussion of travel management is displayed in the Facilities section of this chapter.

The Forest currently has 1,647 miles of system trails. Inadequate maintenance on the trail system hinders dispersed recreation use.

Demand Trends - Factors such as population growth, leisure time, and energy costs will affect dispersed recreation use. Dispersed recreation demand will continue to increase faster than developed recreation. As travel expenses increase, the amount of dispersed recreation on the Forest by local residents will increase. The Forest can supply all of the demand for dispersed recreation opportunities.

There is more demand for winter dispersed recreation facilities (i.e. maintained trails, signing, sanitation facilities) than facilities provided. Table III-10 displays the projected demand for dispersed recreation.

TABLE III-10.

DISPERSED RECREATION DEMAND  
(Thousand RVD's Per Year)

Time Period	Off-Road				Total
	Hunting	Fishing	Motorized	Other	
1981-1985	166	263	179	885	1,493
1986-1990	167	283	202	1,029	1,681
1991-2000	169	304	236	1,254	1,963
2001-2010	171	324	281	1,563	2,339
2011-2020	173	344	326	1,873	2,716
2021-2030	175	364	371	2,183	3,093

### Continental Divide National Scenic Trail

The National Parks and Recreation Act; November 10, 1978; established the Continental Divide National Scenic Trail Corridor. One hundred and thirty miles of this trail corridor are on the Gunnison National Forest. Of the 130 miles, 83 or 64% cross land which offers primitive or semi-primitive non-motorized recreation opportunities. Nineteen miles or 14% cross land which offers semi-primitive motorized recreation opportunities, and 28 miles or 22% cross land which offers roaded natural recreation opportunities.

The Forest has identified the trail on the Gunnison National Forest. Maps displaying the trail location are attached to this Final EIS. Specific descriptions of the trail location are contained in the Forest planning records. The San Isabel National Forest is currently studying a corridor for the trail from Cottonwood Pass to Monarch Pass. The Gunnison National Forest has designated the trail from Cottonwood Pass to Tincup Pass. The trail has not been designated from Tincup Pass to Monarch Pass. The San Isabel National Forest will study further the Cottonwood Pass to Monarch Pass section of the Continental Divide National Scenic Trail.

### The Proposed Dominguez - Escalante National Historic Trail

The proposed trail crosses the Uncompahgre Plateau and the Grand Mesa. This route was designated by Congress for study as a National Historic Trail. A Draft EIS was prepared by the National Park Service. The Forest Service response was to recommend "high potential segments" be identified a National Historic Trail and location criteria be developed. A Final EIS has been completed and submitted to the Environmental Protection Agency. The administration recommends that no Federal action be taken at this time due to the general lack of public support for the trail and the present national budgetary constraints.\*

### National Recreation Trails

The Forest has three National Recreation Trails. The Crag Crest National Recreation Trail is 11 miles long and follows the Grand Mesa ridge. The Crag Crest National Recreation Trail for cross-country skiing is 7.5 miles long in the Scales Lake Area. The Bear Creek National Recreation Trail is six miles long in the rugged mining country near Ouray.

### Wild and Scenic Rivers

The Forest planning process included two Wild and Scenic River Eligibility Reports. Reports were prepared for the East River and the Taylor River. They were listed as potential Wild and Scenic Rivers by the Heritage Conservation and Recreation Services (now the National Park Service) in its nationwide rivers inventory.

The eligibility reports conclude that neither the East River nor the Taylor River are eligible for further consideration for inclusion in the Wild and Scenic River System. See Appendix G for the detailed studies of the two rivers.

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Source: \* Dominguez - Escalante Final National Trail Study.

### Research Natural Areas

One Research Natural Area has been established on the Forest. The Forest planning process evaluated and proposes two other areas for management as Research Natural Areas. A detailed discussion of these areas is available in the Forest planning records. A summary of the three research natural areas follows:

--The Gothic Research Natural Area was designated in 1931, expanded in 1959. It is a 1,050 acre ecological research and study area located 10 miles north of Crested Butte.

--The proposed Escalante Creek Research Natural Area is a 61 acre blue spruce site. It is located in the upper Dry Fork of Escalante Creek.

--The proposed Tabeguache Research Natural Area is a 350 acre site containing ponderosa pine. It is located nine miles northeast of Nucla.

### Special Interest Areas; Cultural and Natural

There are cultural (prehistoric and historic) and natural resources on the Forest. In most cases, the location is kept confidential to protect these resources from vandalism and to preserve them for scientific and educational purposes. The Forest's historic overview is complete in three volumes prepared jointly by the BLM and Forest. Work is proceeding on a portion of the prehistoric overview through a cooperative agreement. Until the prehistoric overview is finished, data will be adapted from the completed BLM prehistoric overview of the surrounding areas.

Approximately 195,000 acres, 7% of the Forest, have been surveyed for cultural resources. Cultural resource surveys take place before any vegetation treatment activities. Vegetation treatment increases the opportunities for significant cultural resource discovery.

Two natural special interest areas are managed on the Forest. The Forest planning process examined the records on 15 other areas for management as special interest areas. A detailed discussion of the areas is located in the Forest planning records. A summary of the examination results of the 17 special interest areas follows.

Dry Mesa Dinosaur Quarry Paleontological Site - The quarry is a 40 acre site located within the Jurassic Morrison formation and contains fossils with a geologic age of approximately 150,000,000 years. This quarry is located 26 miles southwest of Delta. Excavation activity has yielded remains of many different kinds of extinct animals including partial skeletons of animals not previously known to science.

Slumgullion Earthflow National Natural Landmark - The earthflow is a natural geologic process associated with the erosion of unstable geologic and soil features. It includes approximately 900 acres of BLM land, 300 acres of National Forest System land, and 100 acres of private land. It is located two miles south of Lake City. It is designated a National Natural Landmark and is listed in the National Registry of Natural Landmarks. It is not a registered landmark since all owners have not agreed to protect its value. The Colorado Natural Areas Program has also designated the earthflow as a Colorado Special Interest Area.

Proposed Ophir Needles National Natural Landmark - The Ophir Needles is a geologic formation formed by alpine erosion etching out spectacular topographic spires from highly pointed intrusive rock. This intrusive cuts sharply across a varied sequence of sedimentary and volcanic rocks, and the discordant contacts are exceptionally displayed over a vertical range of about 1,000 feet. This formation is 10 miles southwest of Telluride. Ophir Needles is being nominated by the National Park Service for inclusion in the National Registry of Natural Landmarks.

Natural Special Interest Areas Being Studied - Eleven potential National Natural Landmarks are being studied by the National Park Service to determine their eligibility. They include: Cochetopa Park Caldera, Elk Mountains, Fossil Ridge, Lizard Head Pass, Mount Bellview, Mt. Sneffels, Potosi Peak, The Castles, Tomichi Dome, and Waunita Hot Springs. Gothic Research Natural Area is also being studied for dual designation as a National Natural Landmark by the National Park Service.

The Mt. Emmons Iron Bog will be protected from activities detrimental to its maintaining the habitat of Drosera rotundifolia L. This is a small carnivorous round-leaf sundew plant located in peaty or wet, acidic soils. Projected mining activities on adjacent private land may affect the bog. Close coordination will be necessary with the projected mining project.

Natural Special Interest Areas Rejected - Three areas have been studied by the National Park Service and determined to be ineligible to the National Natural Landmark's registry. These include: Black Face; Lizard Head; and San Juan, Silverton and Lake City Caldera Complex.

Proposed Alpine Tunnel Historic District - The district is approximately 60 acres of National Forest System land. It consists of three non-contiguous parcels of railroad that were built as part of the Denver, South Park, and Pacific Railroad. With the tracks reaching 11,523 foot elevation, the Alpine Tunnel became the highest section of adhesion railroad in the world. The Palisades parcel is known for its use of cribbing to stabilize the narrow points of the railroad route. The district is located approximately 40 miles east of Gunnison. The Alpine Tunnel has been nominated to the National Register of Historic Places.

Proposed Englehart Park Archeological District - The district is 664 acres of National Forest System land. It contains nine prehistoric sites and twenty-six prehistoric isolated finds. Englehart Park Archeological District has been nominated to the National Register of Historic Places. The Forest's recommendation is that it be protected by avoidance until agreements are made to interpret or study the area.

## Visual Resource

The Rocky Mountain Region has been divided into three geographic areas for visual resource planning. These areas are: The Southern Rocky Mountains, Central Rocky Mountains, and Great Plains. Each province is divided into ecological land units that have similar landform, vegetation and soil characteristics. These units function as landscape character subtypes. These subtypes are a frame of reference in classifying the physical features of an area into variety classes.

The Forest is in the Southern Rocky Mountain physiographic province and includes eight landscape character subtypes.

The number of landscape character subtypes makes the Forest visually complex. Visual resource management includes reducing undesirable contrast and retaining or creating natural-appearing variety in the landscape. To accomplish this requires that particular attention be paid to the form, line, color, and texture associated by management activities. On the non-forested land, the line, color, and structure placement are especially important. In the forested areas the visual impact on landscape character and variety is critical.

The majority of land on the Forest is visible in middleground and background views from the mountain valleys. Vegetation treatment increases ecological diversity. This usually enhances scenic beauty as long as the treatments emulate natural growth patterns and shapes in the surrounding landscape.

### WILDERNESS

The Forest administers all or portions of eight wilderness areas. These areas are displayed in Table III-11.

TABLE III-11.

#### DESIGNATED WILDERNESS (Grand Mesa, Uncompahgre and Gunnison Acres Only)

Wilderness	National Forest System Acres
Big Blue Wilderness	98,235
Collegiate Peaks Wilderness	48,961
LaGarita Wilderness	79,822
Lizard Head Wilderness	20,342
Maroon Bells-Snowmass Wilderness	19,598
Mount Sneffels Wilderness	16,200
Raggeds Wilderness	42,527
West Elk Wilderness	176,092
<u>TOTAL</u>	<u>501,777</u>

Kannah Creek, Roubideau, and Tabeguache were listed suitable for inclusion in the National Wilderness Preservation System in the RARE II Final EIS. Section 107(b)(2) of the Colorado Wilderness Act released these areas from further wilderness consideration in this planning period. These areas will not be analyzed for wilderness in this Final EIS.

Recreation settings within wilderness are categorized pristine, primitive, semi-primitive, and high density day use. The settings consider area size, trail use, the influence of human activity within and outside the wilderness, opportunity for solitude, and potential for encountering other users.

- Pristine wilderness recreation settings offer very high levels of solitude, very high opportunities for challenge, risk, and self-reliance. Trail and camp encounters will generally be very low, 0 to 2 other parties per day. Primitive wilderness recreation settings offer high levels of solitude, high opportunities for challenge, risk, and self-reliance. Trail encounters will generally be low, less than five other parties per day. Semi-primitive wilderness recreation settings offer moderate levels of solitude, moderate opportunities for challenge, risk, and self-reliance. Trail encounters will generally be moderate to high, 5 to 20 other parties per day. High density recreation settings offer low levels of solitude, low opportunity for challenge, risk, and self-reliance. Trail encounters will generally be high, greater than 20 other parties per day.

#### Oh-Be Joyful Wilderness Study Area

The RARE II Final EIS listed Oh-Be-Joyful unsuitable for wilderness. It was listed a Wilderness Study Area in the Colorado Wilderness Act. A Draft EIS for Oh-Be-Joyful Wilderness Study Area was transmitted to the Environmental Protection Agency on June 4, 1981. The Forest Service preferred alternative in the Draft EIS is unsuitable for inclusion in the National Wilderness Preservation System. The administration is currently completing the Final EIS. If Congress does not act within two years from the date of submission of the President's recommendation to Congress, the Oh-Be-Joyful area will be managed non-wilderness.

Until Congress acts or until two years pass from date of the President's recommendation on the Oh-Be-Joyful Wilderness Study Area, the area will be managed to maintain its existing wilderness character. Existing uses will continue. Livestock grazing will continue and range structural improvements can be maintained and constructed.

#### Existing Wilderness

About 17% of the Forest, 501,777 acres, is designated wilderness. Of this total; 416,043 acres were designated wilderness by the Colorado Wilderness Act.

Current Use and Management - This Final EIS will disclose alternative management direction for the five wildernesses displayed in Chapter I. Table III-12 displays current wilderness use for the five wilderness areas. Capacity of the five wilderness areas is approximately 418,000 wilderness recreation visitor days (RVD's).

TABLE III-12.

## 1980 WILDERNESS USE

Wilderness/Forest	MRVD's*	Trail Miles	MAUM's*
BIG BLUE			
Uncompahgre	52.4	250.0	5.6
LA GARITA			
Gunnison	9.2	120.0	2.3
Rio Grande	22.4	47.0	1.1
MOUNT SNEFFELS			
Uncompahgre	10.9	60.0	.7
RAGGEDS			
Gunnison	12.3	80.0	1.8
White River	1.2	14.5	.6
WEST ELK			
Gunnison	56.0	220.0	9.0
TOTAL	164.4	791.5	21.1

\* MAUM's = Thousand Animal Unit Months.

MRVD's = Thousand Recreation Visitor Days projected back to 1980 use for each wilderness (Recreation Base Year is 1980)

Demand Trends - Future wilderness use can be expected to rise during the next decade at nearly the historic rate of increase. Changes in this rate beyond the next few years will depend on factors such as travel costs and leisure time. Grazing use is expected to remain steady. Table III-13 displays average annual wilderness demand over the planning horizon. The demand estimates have been revised from the Draft EIS based on public comment and additional data.

TABLE III-13.

WILDERNESS DEMAND  
(Thousand RVD's Per Year)

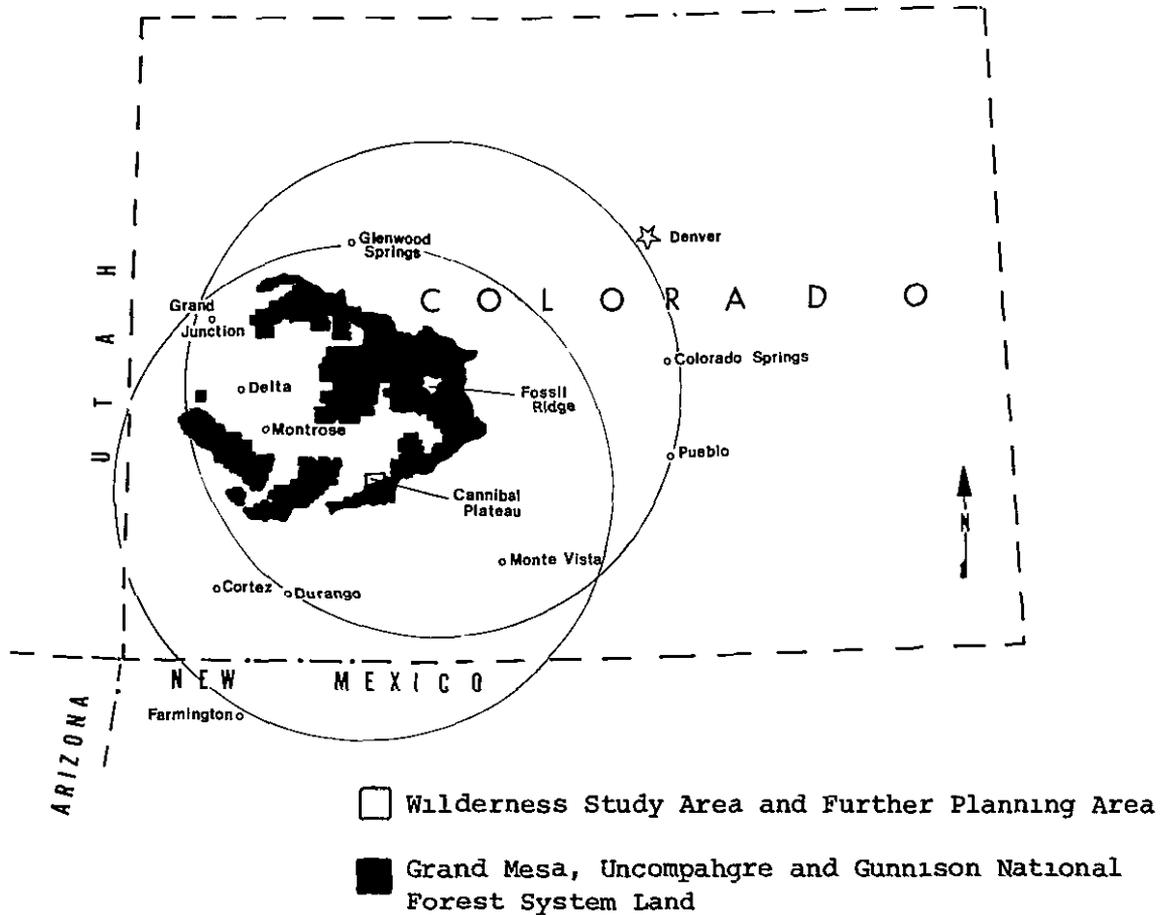
	Time Period					
	1981-1985	1986-1990	1991-2000	2001-2010	2011-2020	2021-2030
Wilderness	176	194	223	268	322	386

Wilderness Study Area and Further Planning Area

There are two areas eligible for wilderness suitability analysis on the Forest. Figure III-5 displays the general vicinity and major population centers within a 100 mile radius of Fossil Ridge Wilderness Study Area and Cannibal Plateau Further Planning Area.

FIGURE III-5.

FOSSIL RIDGE WILDERNESS STUDY AREA AND  
CANNIBAL PLATEAU FURTHER PLANNING AREA  
VICINITY MAP  
(The circles display communities within 100 miles  
of the Study Areas.)



The Fossil Ridge Wilderness Study Area is located in Gunnison County, Colorado, about 8 miles northeast of Gunnison and 125 air miles southwest of Denver. It is roughly located between Taylor Canyon and Union Park on the north and east; and Quartz Creek on the south.

The Cannibal Plateau Further Planning Area is located in Hinsdale County, Colorado, approximately 3 air miles east of Lake City and 160 air miles southwest of Denver. The area is located immediately adjacent to the BLM's Powderhorn Primitive Area. The Primitive Area, containing 40,480 acres, was formally designated by the Secretary of the Interior in August, 1973. In the BLM Wilderness Study, Powderhorn Primitive Area was identified an Instant Study Area. A Draft EIS, which identified Powderhorn Primitive Area plus an additional 4,471 acres (44,951 acres total) suitable for wilderness classification, has been prepared. This primitive area has been recommended for classification as the Powderhorn Wilderness.

Fossil Ridge Wilderness Study Area - The RARE II Final EIS listed Fossil Ridge unsuitable for wilderness. The Colorado Wilderness Act identified Fossil Ridge a Wilderness Study Area (WSA). Fossil Ridge Wilderness Study area contains 47,400 acres of National Forest System land.

The Colorado Wilderness Act requires the Secretary of Agriculture to complete a study of the Fossil Ridge area. The Act provides Congress with unlimited time to act on the administration's recommendation of suitability or unsuitability of Fossil Ridge for wilderness. The Fossil Ridge Wilderness Study Report was attached to the Draft EIS as a separate document and contained more detailed information on the study area.

The Record of Decision which approves the Plan will recommend the suitability or unsuitability of Fossil Ridge Wilderness Study Area for inclusion in the National Wilderness Preservation System.

A legislative EIS will be prepared based on information and analysis disclosed in the Final EIS for the Forest and an analysis of the public hearing records. Public hearings were held on January 11, 1983, in Gunnison and January 12, 1983, in Denver. The Draft EIS for the Forest was issued on October 25, 1982, for public review and comment. The comment period on the Proposed Plan and Draft EIS and the hearing record for the Fossil Ridge Wilderness Study Area closed on February 19, 1983. Chapter VI of this Final EIS documents the consultation and public comment on the Draft EIS, Proposed Plan, and Fossil Ridge Wilderness Study Area.

The legislative EIS with the Regional Forester's recommendation will receive further review and possible modification in the offices of the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States. After the President transmits the Administration's final recommendation to Congress, the legislative EIS will be filed with the Environmental Protection Agency and distributed to the public. Final decisions on wilderness designation have been reserved by Congress.

Until Congress acts, the Fossil Ridge Wilderness Study Area will be managed to maintain its existing wilderness character while still permitting existing uses. Livestock grazing and dispersed motorized recreation will continue and range structural improvements can be maintained or constructed.

Suitability or unsuitability for inclusion in the National Wilderness Preservation System is determined by physical, biological, social, and economic characteristics. This section describes in detail the affected environment and demand trends in the Fossil Ridge Wilderness Study Area.

--Vegetation, Fossil Ridge - Vegetation varies with elevation, which ranges from 9,000 feet to over 13,200 feet. Coniferous vegetation occurs over 60 percent of the WSA, with the dominant species being Engelmann spruce and lodgepole pine. Aspen stands on 10 percent of the WSA, are scattered throughout. The remainder of the WSA is mostly grassland and rock. Carex and fescue are the most abundant vegetation types in non-forest areas. Grass and forb understory vegetation exists. Above timberline, rocklands and rock outcrops commonly preclude any vegetation. The higher peaks have a considerable amount of rock. Soils, are shallow. Alpine vegetation is in good condition, forested areas are generally mature and are progressing through various stages of ecological change. Open parks and riparian areas are in good condition.

There are no known threatened or endangered plants in the Wilderness Study Area. There is a possibility of finding the plant Braya humilis ssp. ventosa (belongs in the mustard family - no common name) growing on limestone outcroppings in the WSA. Two of the four known populations of this subspecies have been found about five air-miles to the east, on Leadville limestone outcroppings. There is no official classification of this subspecies at this time, but it is considered a special management subspecies by the Forest Service. Scouler's willow does occur in the WSA, but it is not considered rare or endangered.

--Landform, Fossil Ridge - Glacial features include cirque basins and head-walls, serrated ridges, and sharp peaks and cliffs. Cirques are abundant at higher elevations. South Lottis Creek is an outstanding example. Depositional features caused by glacial action are not important to the landscape. Erosion has modified other drainages into more of a V-shaped cross-section. Post-glacial ponding behind low moraines has produced flat meadows in some areas, such as along Lottis Creek above Union Park.

--Geology, Fossil Ridge - The Wilderness Study Area is underlain by a mixture of sedimentary, igneous, and metamorphic rocks. The sedimentary rocks are Paleozoic age, 300-600 million years old, and include mostly limestones and sandstones. Associated with the limestone are common marine invertebrate fossils. These sedimentary rocks overlie a Precambrian complex of granite, gneiss, and schist over 1 billion years old. Structural deformation during early Tertiary period, about 40 million years ago, created a number of faults in the area. Most are normal faults but a few appear to be reverse faults. Minor intrusive rocks were emplaced during this period. They include dikes, sills, and irregularly-shaped masses.