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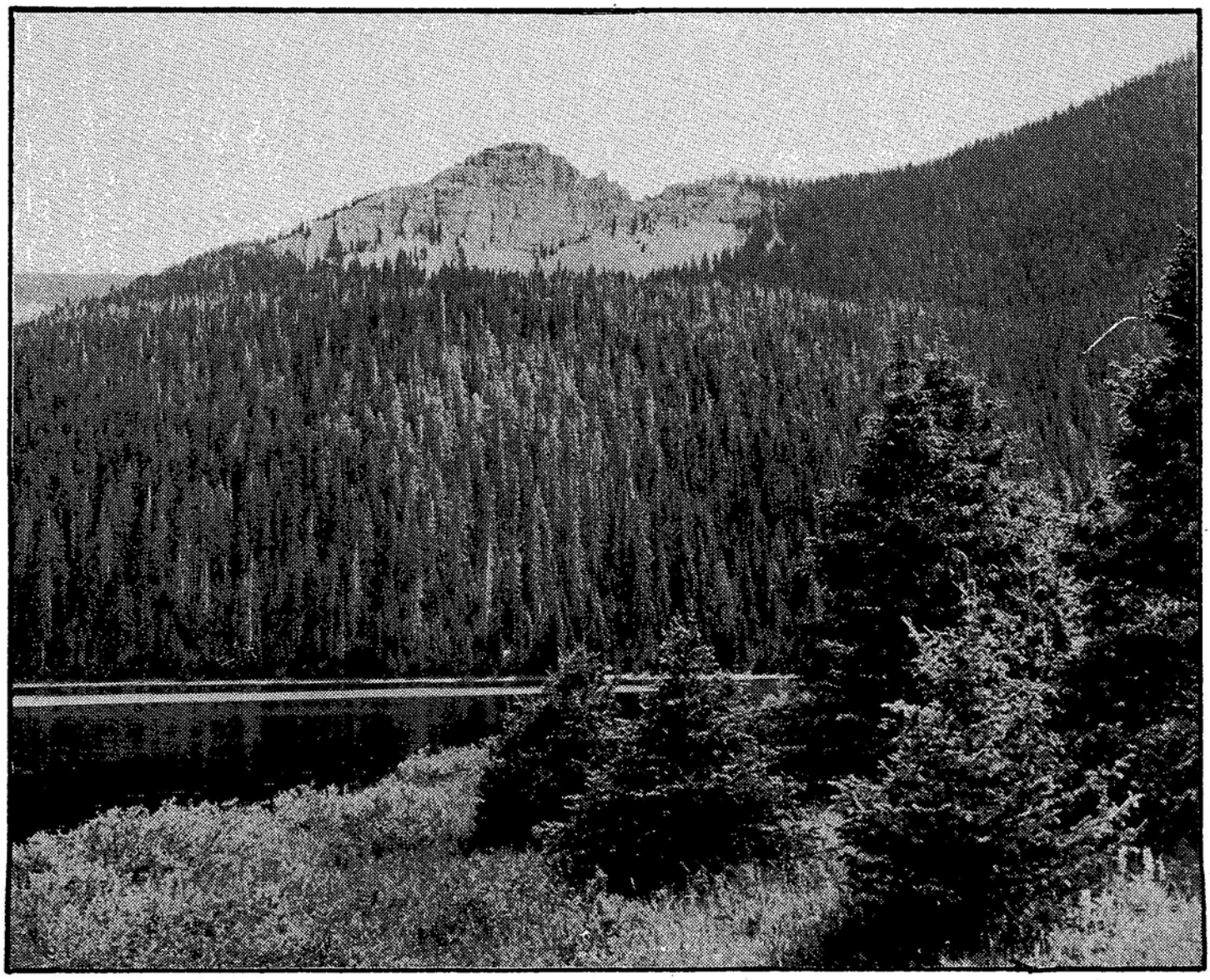
VOLUME I

United States
Department of
Agriculture

Lewis and Clark
National Forest
P.O. Box 871
Great Falls, MT.
59401

Lewis and Clark National Forest Plan [redacted] Environmental Impact Statement



Crystal Lake in the Big Snowy Mountains.

FINAL ENVIRONMENTAL IMPACT STATEMENT

On the Lewis and Clark National Forest
Land and Resource Management Plan

Abstract: This Final Environmental Impact Statement describes the preferred alternatives and other alternatives, including a "no action" alternative, for managing the land and resources of the Lewis and Clark National Forest. The land area involved is 1,843,397 acres in Cascade, Chouteau, Fergus, Glacier, Golden Valley, Judith Basin, Lewis and Clark, Meagher, Park, Ponderosa, Sweetgrass, Teton, and Wheatland Counties, Montana.

The alternatives provide different degree of management resulting in different levels of goods and services. The environmental consequences for the preferred alternative and other alternatives are displayed.

Type of Action:	Administrative
Responsible Federal Agency:	USDA - Forest Service
Responsible Official:	James C. Overbay, Regional Forester Northern Region USDA - Forest Service Federal Building Missoula, MT 59807
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INTRODUCTION

INTRODUCTION	The FEIS (Final Environmental Impact Statement) has been reformated to conform with Regional and National direction. The Preferred Alternative (G) has been modified slightly in response to public comment on the DEIS-Supplement. These changes are identified throughout the FEIS. Forest management is long term in nature. Decade 1 (Planned) management activities will affect Forest outputs and resources for many decades; therefore, in order to evaluate the effects of future management alternatives on resources, outputs, and land management options, this EIS projects outputs and environmental effects for decades 2 through 15 (Proposed). Amendments to the Forest Plan, periodic revisions of the Forest Plan (every 10 to 15 years), and changing social desires for National Forest management may significantly alter these projections. This environmental impact statement contains a summary and six chapters. The chapters are:
Chapter I	Chapter I, Purpose and Need for the Proposed Action, describes the planning process used in the Lewis and Clark Forest Plan. The Resources Planning Act (RPA); the relationship between RPA and the Forest Plan; roadless area evaluation; and the Montana Wilderness Study Act are all discussed. A general description of the Forest's two divisions, the Rocky Mountain and Jefferson, and the mountain ranges they contain are also covered. Public issues and management concerns addressed in the Plan are listed and discussed.
Chapter II	Chapter II, Alternatives Considered, examines each of the alternatives analyzed in the planning process, including the Current Plan and the Preferred Alternative (G). Comparisons between the alternatives and how each alternative effects the resources is discussed. Much of the "process" type information has been removed from Chapter II. This information can now be found in Appendix B. Additional information has been added to Chapter II on the effects of the alternatives. The table showing Resource Outputs and Alternative Comparisons has been expanded and is now located at the end of the chapter.
Chapter III	Chapter III, Affected Environment, describes in detail the various physical, biological, social, and economic environments that may be affected by the Forest management. Additional information has been provided on the affected environment.

INTRODUCTION

Chapter IV	Chapter IV, Environmental Consequences, identifies the environmental consequences which could result from Forest management activities scheduled in each alternative. Additional information has been provided on the environmental consequences of all major activities and resource programs occurring under the various alternatives. Table 4.1, showing the resource production and effects by alternative has been separated and incorporated in the appropriate place throughout Chapter IV.
Chapter V	Chapter V, List of Preparers, shows the people responsible for conducting the environmental analysis and writing the environmental documents.
Chapter VI	Chapter VI, Consultation With Others, highlights public involvement and summarizes public comment and Forest Service responses to these concerns. Also listed are the persons, agencies, and organizations to whom copies of the FEIS are sent. A Glossary, Bibliography, and Index are also include
Appendix A	Appendix A describes in detail of how issues, concerns, and opportunities were identified.
Appendix B	Appendi B describes in detail the analytical process, including (1) data and information collection, (2) the Forest Planning model (FORPLAN), (3) cost efficiency and net public benefit analysis, (4) social and economic impact analysis, (5) analysis prior to development of alternatives, and (6) formulation of alternatives.
Appendix C	Appendix C describes the site-specific wilderness evaluation of the Lewis and Clark roadless areas.
Appendix D	Appendix D lists the planning records that are available on request.
Appendix E	Appendix E lists the commentators to the DEIS and displays letters from Federal, State, and Local Agencies and Forest Service responses.
Appendix F	Appendix F lists the commentators to the DEIS-Supplement and displays letters from Federal, State, and Local Agencies and Forest Service responses.
Appendix G	Appendix G contains the additional public comments and Forest service responses. It is available for review at the Lewis and Clark Forest Supervisor's Office.

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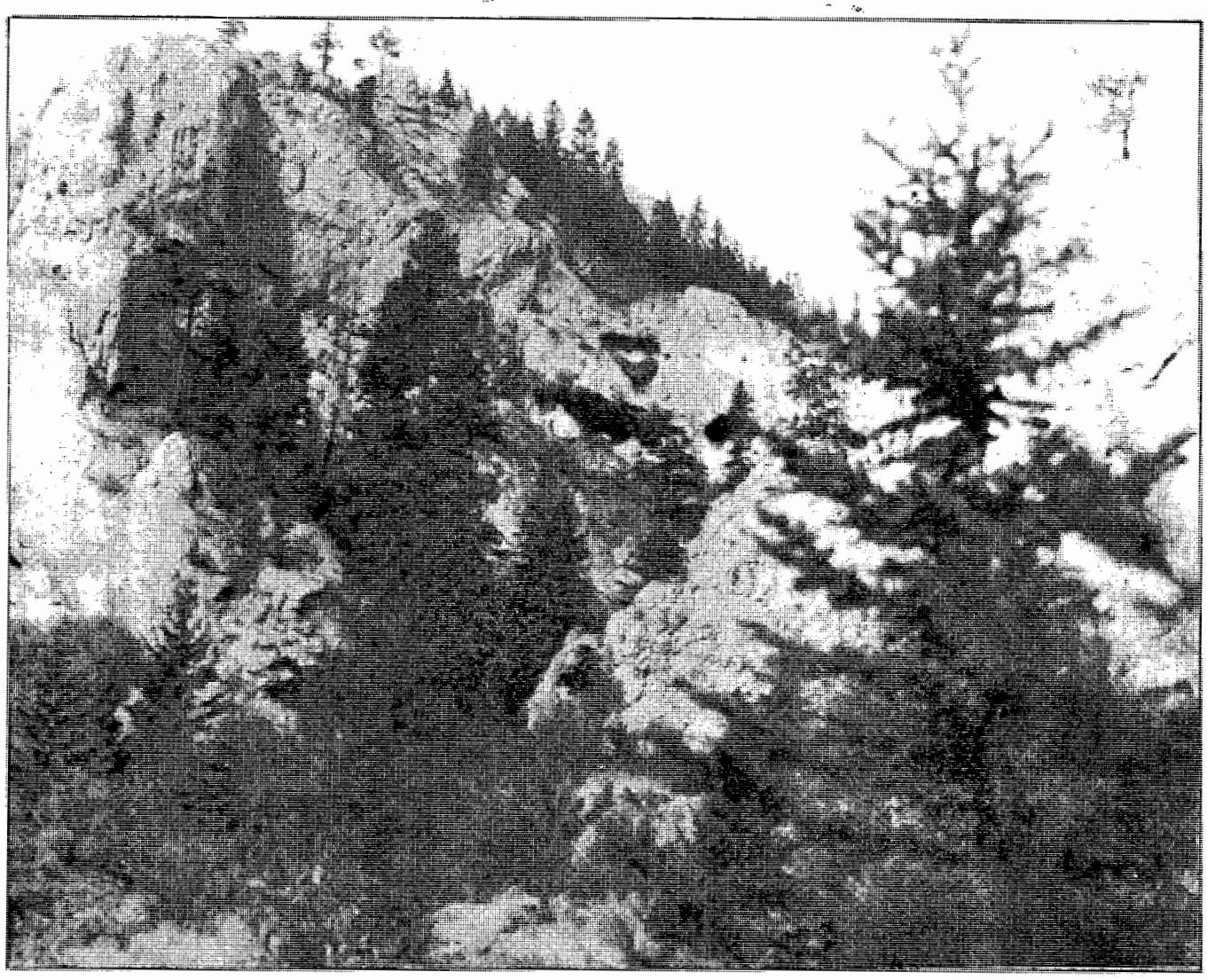


Arch Coulee on the Middle Fork of the Judith River.

FEIS
Summary

Overview

The first part of this Summary describes the planning process, gives a general description of the Forest and lists the planning issues. The second part describes alternative formulation, benchmarks, alternatives that were eliminated from further study, and alternatives that were considered in detail. Table S.1 shows the resource production and effects by alternative. Next comes a summary of the environmental consequences of each alternative. The last part describes the planning coordination and response to the DEIS and DEIS-Supplement.

A more detailed description of these actions can be found in the FEIS (Final Environmental Impact Statement) for the Lewis and Clark Forest Plan.

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

These documents are available for review at all Lewis and Clark offices located at Augusta, Choteau, Stanford, Harlowton, White Sulphur Springs, Belt Creek, and Great Falls. Request for copies of the FEIS or Forest Plan should be sent to:

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

PURPOSE AND NEED

INTRODUCTION

The FEIS (Final Environmental Impact Statement) documents the analysis and discloses the significant environmental effects for a Proposed Action and other alternatives for the future management of land and resources of the Lewis and Clark National Forest. The Proposed Action is the basis for the Forest Land and Resource Management Plan (Forest Plan) which is described in a separate document.

These documents were developed under direction from RPA (National Forest and Rangeland Renewable Resource Planning Act), NFMA (National Forest Management Act), NEPA (National Environmental Policy Act) and their implementing regulations.

BACKGROUND

In 1976, Congress passed the NFMA (National Forest Management Act), an amendment to the RPA (Forest and Rangeland Renewable Resources Planning Act) of 1974. NFMA requires each National Forest to formulate an intergrated plan, to incorporate guidance for all natural resource management activities.

Planning Process

The NFMA implementing regulations outline the following planning process used in this plan.

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

Remaining Process

This FEIS was prepared after completion of planning actions 1 through 7. As part of planning action 7, a DEIS and Proposed Lewis and Clark National Forest Plan were prepared for public review. A DEIS-Supplement, which included an evaluation of lands suitable for wilderness classification, and Revised Forest Plan were issued after the review periods, planning actions 1 through 7 were repeated as needed. Next, this FEIS was prepared, filed with the Environmental Protection Agency, and made available to the public. The FEIS and Forest Plan will then be used by the Regional Forester as an information base for a Record of Decision to complete the planning steps.

PURPOSE AND NEED

Wilderness Study

The Forest contains three wilderness study areas: Middle Fork Judith, Big Snowies, and Deep Creek-Reservoir North.

As part of the Forest planning process, the Regional Forester recommended non-wilderness for the Middle Fork Judith and the Big Snowies Wilderness Study Areas. Wilderness studies on these lands are required by the MWSA (Montana Wilderness Study Act) of 1977 (Public Law 95-150).

Final recommendations on the Middle Fork Judith and Big Snowies Wilderness Study Areas are being made through a separate FEIS. As in the draft, the FEIS recommends nonwilderness for both areas. These nonwilderness recommendations will receive further review and possible modification in the offices of the Chief of the Forest Service, the Secretary of Agriculture, and the President. Congress has reserved the right to make final decisions on wilderness designation.

The Regional Forester will not make a recommendation on the Deep Creek-Reservoir North Wilderness Study Area until the area's oil and gas potential has been determined.

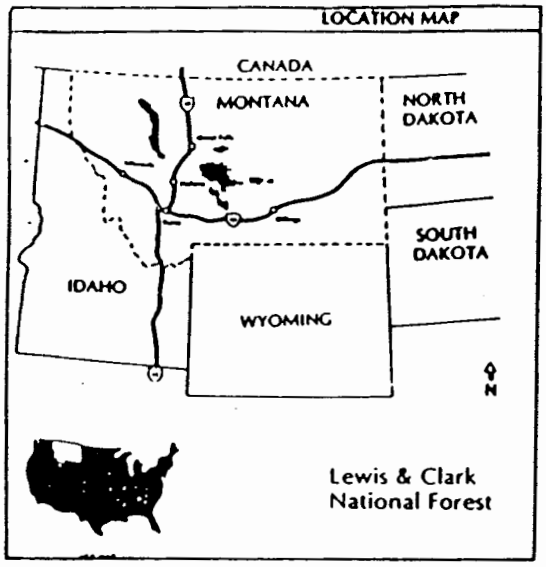
Until Congress determines otherwise, recommended wilderness additions and wilderness study areas will be managed, subject to existing private rights and uses, to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System. After Congress's decision, further analysis may be necessary to incorporate its decision into the Forest Plan.

Previous Plans

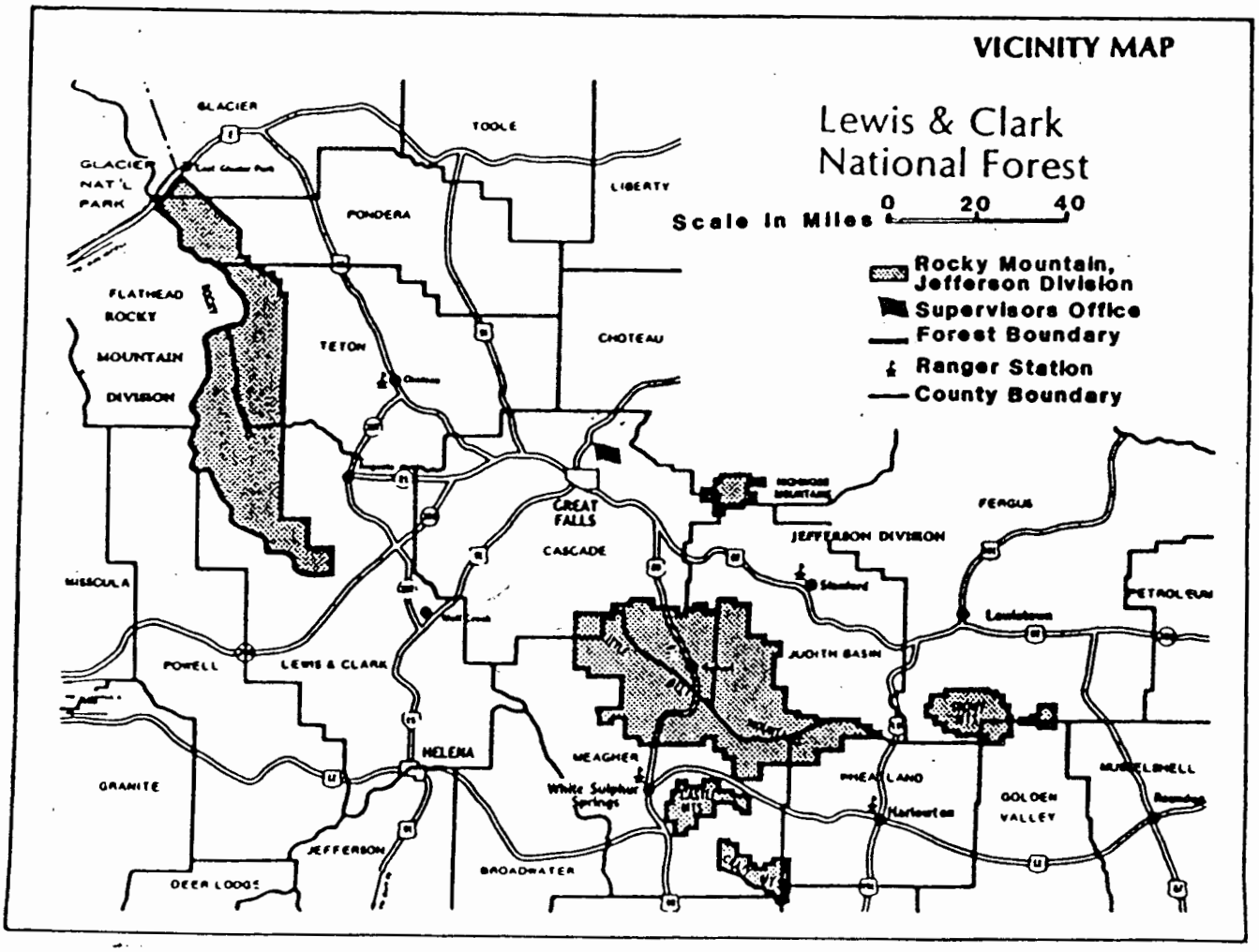
The Forest Plan will supersede all previous resource management plans. After approval of the Plan, all permits, contracts, leases, and other instruments for the use and occupancy of National Forest System lands must conform with the Forest Plan. Also, all subsequent activities affecting the Forest, including budget proposals, will comply with the Forest Plan.

PURPOSE AND NEED

GENERAL DESCRIPTION



The Lewis and Clark National Forest is in north-central Montana within the upper Missouri River system. The Lewis and Clark National Forest encompasses 1,999,022 acres with the National Forest System boundary. Of this 1,843,397 acres are National Forest System land and the remainder are privately owned. Historically, the Forest has been referred to by two major divisions: the Rocky Mountain Division, containing the Rocky Mountain Ranger District, and the Jefferson Division, containing the Judith, Musselshell, and Kings Hill Ranger Districts. The Supervisor's Office is located in Great Falls.



PURPOSE AND NEED

ISSUES, CONCERNS, AND OPPORTUNITIES	The first of the ten planning steps involves identification of issues, concerns and opportunities. This determines the changes and benefits that people want in goods, services, and uses, and environmental conditions for the Lewis and Clark National Forest. Following is a list of the public issues and management concerns identified for the Lewis and Clark National Forest.
Recreation	- What recreation activities and use levels should be permitted? - How many campgrounds or camping sites should be provided? - What facilities should be provided at developed campgrounds? - Should existing summer home permits be continued? - What opportunities for both summer and winter off-road vehicle use should be provided? - How much control (enforcement, closures, education) of off-road vehicles should be implemented?
Cultural Resources	- How can the Forest carry out identification, protection, interpretation, and management of cultural resources? - What is the best way to protect special management areas?
Research Natural Areas	- How can the Forest identify candidate research natural areas containing specific grassland, shrub, and forest habitat types and aquatic ecosystems to meet Regional targets?
Wilderness	- Should the Deep Creek-Reservoir North RARE II further planning area be recommended to Congress for inclusion in the National Wilderness Preservation System? - Should the amount of wilderness use be controlled and how? - Which roadless areas on the Lewis and Clark National Forest should be recommended for wilderness designation?

Wildlife and Fish	- How much fish and wildlife habitat should be improved and to what extent? - Some reviewers supported increasing the wildlife habitat improvement program. - How should conflicts be resolved between wildlife and management activities of: livestock grazing; timber; oil and gas exploration and development; minerals; recreation; wilderness? - How much oil and gas activity can be accepted and still meet the intent of the Endangered Species Act?
Range	- How much livestock grazing should be provided? - Can and should the range structural and non-structural improvement program be involved and how? - What are the effects of the following on livestock grazing; clean water act; early hunting season; wilderness management; wildlife management; timber management; recreation management. How can the impacts be resolved? - How and where should range be provided for elk as well as cattle? - How can control of noxious weeds be improved and to what extent?
Timber	- How much timber should be harvested? - How can timber sales be prepared to provide proper coordination with other resources? - Should sales, including timber salvage, be planned on uneconomical areas? - What degree of slash cleanup should be required after timber harvest? - What clearcutting, if any should be allowed and how could clearcutting be coordinated with other uses? - How much and what kind of reforestation is appropriate? - Should permits be required for free-use firewood cutting and what control should be established?

PURPOSE AND NEED

Minerals	- How much mineral exploration and development should be allowed? - How should conflicts between exploration for and development of mineral resources and surface resource values be resolved? - How can the Forest help achieve the national need for energy self-sufficiency through conservation of renewable and nonrenewable energy resources?
Soil and Water	- What coordination is necessary between water and other resources to protect watershed values and water quality? - What measures are necessary to prevent or reduce erosion from: road and trail maintenance, off-road vehicle use, timber sales, and oil and gas exploration and development?
Human and Community Development	- How do the rights accorded to the Blackfeet Indian Tribe in the agreement modified by Congress in 1896 affect management of National Forest land covered in that agreement?
Lands	- What landownership adjustment would support resource management goals and where should the Forest place its priorities in an adjustment program?
Facilities	- What is adequate access to and within the National Forest? - Should additional trails be provided? - What roads should be maintained and to what extent?
Protection	- How much, if any, prescribed burning should be planned? - To what extent and in what manner should insect and disease control be carried out?
Cost Efficiency	- Consider the need to provide goods and services efficiently.

ALTERNATIVE FORMULATION	Alternative formulation, planning action 5, resulted from the four planning actions described below.
Planning Action 1- Identification of Issues, Concerns, and Opportunities	Public issues and management opportunities were identified through public involvement and coordination with other Federal agencies, state agencies, local governments, and the Blackfeet Indian Tribe. Forest Service management concerns were added. Details on the process used to develop issues, concerns, and opportunities are available in the planning record, "Identification of Public Issues and Management Concerns."
Planning Action 2- Development of Planning Criteria	Planning process and management criteria were established. The interdisciplinary team developed criteria for the inventory data collection, the management situation analysis, and the alternative formulation. Process criteria are documented in the planning record, "Proposed Criteria and Documentation."
Planning Action 3- Inventory of Data and Information Collection	By using Forest resource inventories, a multi-resource data base was formed and stored in a computer retrieval system. Details of the data base content are in the planning record, "Data Base Components." Social and economic data for the counties directly affected by the Forest are in the planning record, "Social Impact Assessment Baseline, 1980."
Planning Action 4- Analysis of the Management Situation	The Analysis of the Management Situation identified: (1) feasible ranges of goods, services, and uses (i.e. benchmarks); (2) projected use levels; (3) potential to resolve issues and concerns; and (4) the feasibility of providing the levels of goods, services, and uses resulting from assigned RPA objectives. This analysis identified the opportunity to change management direction and is documented in the planning record, "Analysis of the Management Situation."
Planning Action 5- Formulation of Alternatives	Alternatives list different ways to address and respond to the major public issues, management concerns, and resource opportunities. Alternatives result from planning actions 1 through 4 and are documented in the planning record, "Alternatives."

BENCHMARKS

The primary analysis prior to developing alternatives was the Analysis of the Management Situation which is the determination of the ability of the Forest to supply goods and services in response to society's demands. Eight benchmark levels were developed to define resource supply potentials and economic relationships of the Forest. Production capabilities were determined for a minimum level, for single resources, and for a set of multiple resource outputs that maximize present net value.

Minimum Level - This benchmark defines the minimum costs of public landownership and the resource outputs which are incidental to custodial management.

Current Direction - This benchmark level defines the current level of goods and services and the most likely amount of goods and services expected to be provided in the future if current management direction continues.

Maximize Timber - This benchmark is designed to measure the maximum legal capability of the Forest to produce timber.

Maximize Range - Livestock forage production was maximized to determine the suitable range potential.

Maximize Recreation - Using market values and dispersed and developed recreation assigned values, this benchmark maximizes the Forests capacity to supply recreation.

Maximize Elk - The purpose of this benchmark is to maximize wildlife values with an emphasis on elk potential.

Maximize Wilderness - Wilderness management was maximized through designating all roadless areas to wilderness.

Maximize Present Net Value - Using market values for timber, range, mineral leases and developed recreation, this benchmark established the mix of resource uses combined with a schedule of outputs and costs that maximize present net value.

ALTERNATIVES DEVELOPED

The alternatives to be considered in detail and those eliminated from detailed study were identified after completing the Analysis of the Management Situation. The benchmark analysis prevented formulating alternatives that could not be implemented. A large number of alternatives could have been developed. Effort was concentrated in developing a reasonable range of alternatives that could be analyzed within the capability of the Forest and that were responsive to public issues and management concerns.

ALTERNATIVES ELIMINATED FROM DETAILED STUDY

The Forest developed and examined several alternatives that were eliminated from detailed analysis. Timber and grazing outputs significantly below current levels were considered during alternative formulation and dismissed.

Public Workshop Alternatives

The Forest developed six preliminary alternatives using the responses from a series of public workshops (see planning record, "Alternatives from Public Involvement").

Two of the alternatives became Alternatives A and C. Three other public workshop alternatives centered on oil and gas leasing which the Forest had already made a decision on before completion of the Forest Plan. Because the three workshop alternatives could be represented by B and C without the oil and gas segments, they were considered as Alternatives B and C in detailed study.

The sixth public workshop alternative was eliminated from detailed study. This alternative produced a high level of timber harvest with a moderate level of grazing and minerals. Dispersed recreation, developed recreation, wildlife habitat, and soil and water quality were maintained. Based on the Analysis of the Management Situation, maintaining wildlife habitat (particularly for big game) at the present level would not be possible with a high level of timber harvest and a moderate level of grazing. Therefore, this alternative was eliminated from detailed study.

Other Alternatives

Two other alternatives, RPA Low Bound and Mountain Pine Beetle, were eliminated from detailed study.

RPA Low Bound

The 1980 RPA Assessment directed the Forest to analyze a RPA Low Bound Alternative. The "Revised President's Statement of Policy" of December 1980 accepted only the high bound outputs as the RPA Recommended Program. Therefore, the low bound alternative was eliminated from detailed study.

Mountain Pine Beetle

NFMA regulations allow a forest to depart from non-declining yield if certain conditions are met. One of these conditions is high mortality losses from any cause that can be significantly reduced or prevented.

Significant lodgepole pine loss could result from a mountain pine beetle epidemic. This alternative tests the feasibility of preventing catastrophic losses by harvesting highly susceptible trees before they are infested. This alternative departs from non-declining yield.

This alternative would harvest timber over the first four decades at the same rate as the maximum timber benchmark. To harvest the timber, large tracts would have to be roaded (roading would be expensive and would disturb wildlife habitat and semi-primitive recreation). For these reasons, this alternative was not considered for further detailed analysis.

Non-Wilderness Alternative

A complete non-wilderness alternative was considered, but was eliminated from detailed study. The complete non-wilderness alternative would have maintained existing wilderness, but recommended 0 additional acres for wilderness classification. Alternative G recommends 51,834 acres for wilderness classification. In a non-wilderness alternative these 51,834 acres would be available for oil and gas leasing. All other resources would have been treated the same as in Alternative G and resource outputs and PNV would have been essentially the same for the two alternatives.

Since the 51,834 acres recommended for wilderness in Alternative G represent less than 5 percent of the total roadless area under consideration for wilderness; and since a complete non-wilderness alternative and Alternative G are nearly equal in all other respects, the non-wilderness alternative was dropped from detailed study.

ALTERNATIVES CONSIDERED IN DETAIL

The benchmarks were used to develop sixteen alternatives that represent a range of resource outputs. Each alternative was formulated so that multiple resource uses occur and the minimum management requirements are met. Each alternative harvests timber, provides forage for livestock and big game, manages wilderness, provides a mix of recreation opportunities, makes lands available for minerals, and provides wildfire protection. Each alternative provides sufficient habitat for the indicator species to meet or in most cases exceed the requirements for viable population levels. The difference between alternatives is reflected in the amount and emphasis placed on the individual resources and how well each alternative responds to the issues and concerns.

Range of Alternatives

An adequate range of alternatives was developed by first formulating the alternatives that were required by regulation or policy. This included one that maximized timber production and most market opportunities (Alternative A), one alternative that reflected the current program (Alternative Current Plan), one that recommended wilderness classification for roadless lands (Alternative H), one that recommended no additional wilderness (Alternative G), and one that recommended wilderness classification for a substantial portion of the roadless areas while providing commodity production on the remainder of the Forest (Alternative H).

These alternatives were then examined to determine where they fit in the range of outputs expressed by the benchmarks, and how well they responded to the issues.

Additional alternatives were then developed that responded in different ways to the wilderness issues (Alternatives I, J, and K). Another alternative considered a departure from nondeclining timber harvest flow (Alternative F-Departure) while others considered the maximum production of big game (Alternatives C & I). These alternatives, including the one designed to meet RPA targets (Alternative A) and a proposed plan (Alternative G), helped to complete the range of alternatives. All of the alternatives considered are implementable options for management of the Lewis and Clark National Forest.

The 16 alternatives were tested against the benchmark capacities in order to determine if a sufficient range had been provided to respond to major issues.

Current Direction (No Action Alternative)	Under current direction, the Forest would annually offer for sale 13 million board feet of timber. In addition, personal use firewood cutting would continue to annually remove about 10 million board feet of dead timber. Miles of road building would be directly related to timber harvest. The annual miles of arterial/collector road construction varies from about 1.5 to 5.0 in the planning horizon. Local road construction would be about 11 miles annually. Annual livestock grazing would remain at 71,000 AUMs annually. Wildlife habitat improvement would be done on about 460 acres yearly. Habitat potential for the current elk population (8,500 animals) would remain constant because of an aggresive road closure program that maintains security. Habitat for T&E species would be maintained or improved. About 65 acres of the total wildlife improvement program would be for T&E species habitat. Developed recreation opportunities would remain at 198,500 RVDs; no additional facilities would be built. The two Montana Wilderness Study Act areas would be managed to protect their wilderness character. Over 423,000 acres are leased for oil and gas exploration and development. All parts of the Forest, except existing wilderness, would be available for mineral entry. In the first decade, yearly average budget expenditure of $3,890,000 produces outputs and activities that provide $1,185,000 in receipts to the U.S. Treasury and 946 private sector jobs. The present net value for the entire 150 year planning horizon is $182,620,000.
Alternative A (RPA)	Alternative A would meet RPA objectives. This alternative would meet the direction in the "Revised President's Statement of Policy" which states, "at least one alternative in the EIS will be developed to determine how the 1980 Forest and Rangeland Renewable Resources Planning Act (RPA) Program could be best implemented on the Forest." The RPA Recommended Program emphasizes high levels of timber harvesting, livestock grazing, and increasing road access. By the fifth decade, 41 million board feet of timber would be offered for sale annually. Personal use firewood cutting would continue.

Grazing would increase from 71,000 AUMs to 86,400 AUMs as a result of more intensive management and incorporation of transitory range from timber harvest into allotments. Even though the wildlife habitat improvement program would triple to about 1138 acres annually, there would be a decrease in elk and catchable trout populations because of increased roading and grazing. Annual arterial and collector road construction would reach near 18 miles per year by the fifth decade and decrease to zero by the fourteenth decade, when all necessary roads would be in place. Local road construction would peak at 47 miles annually in the sixth decade and decrease to zero by the fourteenth decade. Habitat for T&E species would be maintained. About 150 acres of the total wildlife improvement program would be for T&E species habitat. Developed recreation would increase about 32,000 RVDs. Dispersed recreation opportunities in a roaded natural setting would increase significantly.

The Forest would recommend that all new oil and gas leases have standard stipulations to protect surface resource values. Special stipulations on existing leases would be reviewed and revised to be consistent with RPA goals. The increased access resulting from roading for the timber harvest would make mineral exploration easier.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification. Deep Creek-Reservoir North area would remain in a further planning status until the oil and gas potential has been explored under all the alternatives.

In the first decade, yearly average budget expenditure of $4,820,000 produce outputs and activities that provide $1,935,000 in receipts to the U.S. Treasury and 1132 private sector jobs. The present net value for the entire 150-year planning horizon is $256,800,000.

Alternatives A-1 and A-2

MWSA areas would be either recommended for wilderness classification (A-1) or managed with the rest of the Forest as described above (A-2).

Alternative B

Alternative B would increase the use of Forest resources while maintaining a variety of dispersed recreation opportunities.

Timber harvest and livestock grazing would increase. By the fifth decade, 23.7 million board feet of timber would be offered for sale annually.

Arterial/collector and local road construction would increase. Grazing would increase from 71,000 AUMs to 81,400 AUMs as a result of more intensive management. Wildlife habitat improvement would decrease slightly from the current 460 acres to about 440 acres per year. However, T&E habitat would be maintained. Of the total wildlife improvement program, 68 acres per year would be for T&E habitat. Elk population potential would drop slightly from the current 8,500 to 8,200 by the fifth decade. Increased timber harvest would increase dispersed recreation opportunities in roaded natural settings. Select areas in a semi-primitive recreation setting would be maintained. Developed recreation would remain at the current level, 198,500 RVDs. The Forest would continue to recommend no-surface occupancy, limited surface use, and timing restrictions on two-thirds of the acres in new and reissuance leases.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification.

In the first decade, yearly average budget expenditure of $4,160,000 produce outputs and activities that provide $1,386,000 in receipts to the U.S. Treasury and 969 private sector jobs. The present net value for the entire 150-year planning horizon is $235,200,000.

Alternatives B-1 and B-2

MWSA areas would be recommended for wilderness classification (B-1) or managed with the rest of the Forest as described above (B-2).

Alternative C

Alternative C would increase the Forest's wildlife program.

About 12.5 million board feet of timber would be offered for sale annually. This is slightly less than the current level. Timber harvesting would be precluded in most areas that are currently in a semi-primitive setting. Livestock grazing would decrease slightly to 70,000 AUMs, by the fifth decade. Elk and catchable trout habitat capacity would increase because the wildlife and fish improvement programs would nearly triple, yet the timber harvest and road construction programs would be slightly less than current levels. Of the 1228 acres of annual wildlife habitat improvement, 155 acres

would be for T&E species habitat. By the fifth decade, an additional 15,000 RVDs of developed recreation would be provided. Most semi-primitive recreation opportunities would be maintained. Additional oil and gas leasing with surface occupancy would be recommended only on areas which are currently accessible and which are not extremely sensitive. To protect wildlife, timing restrictions would be recommended on most new oil and gas leases.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification.

MWSA areas would be managed for semi-primitive recreation and wildlife habitat, especially elk, through habitat improvement.

In the first decade, yearly average budget expenditure of $4,110,000 would produce outputs and activities that provide $1,185,000 in receipts to the U.S. Treasury and 947 private sector jobs. The present net value for the entire 150 year planning horizon is $180,300,000.

Alternative D

Alternative D would respond to the increasing national and local demand for livestock grazing and outdoor recreation.

To increase transitory range, 12.5 million board feet of timber would be offerd for sale, which is slightly less than the current level. Road construction would decrease slightly from the current direction because of the reduced harvest level. Livestock grazing would be increased to 89,900 AUMs by incorporating the transitory range into allotments and intensive range management. Dispersed recreation opportunities in roaded natural setting would increase. Many semiprimitive recreation opportunities would be maintained. There would be no timber harvest in these areas. Developed recreation opportunities would increase by 32,000 RVDs, by the fifth decade. The wildlife habitat improvement program would decrease slightly from the current direction of 466 acres per year to about 440 acres. This decrease combined with an accelerated range program results in a decline in elk habitat potential. Elk numbers are projected to decrease to 7,800 by the fifth decade.

Catchable fish potential is also projected to decrease because of increased grazing. Habitat for T&E species will be maintained or improved. The annual habitat improvement would increase from the current 66 acres to 71 acres. Nosurface occupancy or limited surface use would be recommended for some new oil and gas leases. Timing and activity coordination restrictions would continue to be used on two-thirds of the acres in new and reissuance leases.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification.

In the first decade, yearly average budget expenditures of $4,070,000 produce outputs and activities that provide $1,333,000 in receipts to the U.S. Treasury and 947 private sector jobs. The present net value for the entire 150 year planning horizon is $184,470,000.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for timber and for semi-primitive recreation.

Alternative E

Alternative E would harvest timber and graze livestock where most productive.

The Jefferson Division would have a high level of timber harvest and grazing. This would require more roads for access. By the fifth decade, about 34 million board feet of timber would be offered for sale annually. Grazing would increase from 71,000 to 84,700 AUMs. Dispersed recreation in a roaded natural setting would increase. Developed recreation in the Jefferson Division would increase by 4,000 RVDs, by the fifth decade. To protect surface resource values, the Forest would recommend standard stipulations on new oil and gas leases.

In the Rocky Mountain Division wildlife habitat management and semi-primitive recreation would be emphasized. All the T&E habitat is in this Division and would be maintained or improved. Timber would not be harvested on a regulated basis. There would be no road construction for surface resource management. The Forest would continue to recommend no-surface occupancy, limited surface use, the activity coordination stipulation, and timing restrictions on parts of all new oil and gas leases.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification.

In the first decade, yearly average budget expenditures of $4,230,000 would produce outputs and activities that provide $1,438,000 in receipts to the U.S. Treasury and 959 private sector jobs. The present net value for the entire 150 year planning horizon is $242,480,000.

Alternatives E-1 and E-2

MWSA areas would be either recommended for wilderness classification (E-1) or managed with the rest of the Forest as described above (E-2).

Alternative F

Alternative F would increase the use of Forest resources and would maintain dispersed recreation opportunities in a semi-primitive setting.

By the fifth decade, 24 million board feet of timber would be offered for sale annually, which is almost double the current program. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Road construction would increase. Livestock grazing would increase from 71,000 to 79,200 AUMs, by the fifth decade. Some of this increase would be from grazing on big-game winter range and in riparian zones.

To minimize impacts on wildlife and fish, the annual habitat improvement program would be increased from 466 acres to 678 acres, by the fifth decade. Also, projects affecting the wildlife habitat and fisheries would be coordinated with the Forest Wildlife Biologist. Elk population potential is expected to decrease by 100 animals and catchable fish potential is expected to drop by 12,000 fish. All T&E habitat would be maintained. Of the total wildlife improvement program, 85 acres would be for T&E habitat.

Developed recreation would increase about 32,000 RVDs, by the fifth decade. Most semi-primitive recreation settings would be retained. The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and timber production. Harrison and Cleveland Creek drainages, covering most of the westerner portion, would be managed for timber.

In the first decade, yearly average budget expenditures of $4,620,000 would produce outputs and activities that provide $1,186,000 in receipts to the U.S. Treasury and 969 private sector jobs. The present net value for the entire 150 year planning horizon is $223,040,000.

Alternative F-Departure

NFMA regulations allow a Forest to depart from non-declining yield if certain conditions are met. One of these conditions is that high mortality from any cause can be significantly reduced or prevented. High mortality of lodgepole pine could result from epidemic infestations of mountain pine beetle.

Alternative F's (Departure) timber harvest would increase to 28.1 million board feet after the fourth decade and then decline to the long-term sustained yield capacity of 26.6 million board feet, after the fifth decade. Livestock grazing would increase from 71,000 to 79,200 AUMs, by the fifth decade. Developed recreation would increase about 32,000 RVDs, by the fifth decade. Dispersed recreation opportunities in a roaded natural setting would increase. The effects on wildlife would be the same as in Alternative F. Implementation of a departure schedule would require immediate increases in funding for collector roads, new road rights-of-ways, and personnel.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification. Deep Creek-Reservoir North area would remain in a further planning status.

The MWSA areas will be allocated as in Alternative F.

In the first decade, yearly average budget expenditures of $4,940,000 would produce outputs and activities that provide $1,353,000 in receipts to the U.S. Treasury and 980 private sector jobs. The present net value for the entire 150 year planning horizon is $229,600,000.

Alternative G-
Preferred Alternative *

Alternative G would increase the use of Forest resources, while providing diverse wildlife habitat and maintaining dispersed recreation opportunities in a semi-primitive setting.

By the fifth decade, 20 million board feet of timber would be offered for sale annually. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would provide wood products for local needs. Arterial and collector road construction would decrease from the current direction, but local road construction would almost double. Livestock grazing would increase from 71,000 AUMs to 73,600 AUMs, by the fifth decade. Adverse impacts on wildlife habitat would be minimized through coordination and mitigation. No additional grazing would be planned on big-game winter range or riparian zones, unless wildlife needs could be fully met. Annual wildlife habitat improvement would increase to 950 acres, of which 100 acres would be for T&E species. Developed recreation would increase about 32,000 RVDs, by the fifth decade. Most semi-primitive recreation settings would be retained. The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases.

Five areas (collectively called the East Slope) totalling 51,834 acres would be recommended as additions to the Bob Marshall and Scapegoat Wildernesses.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

*The Preferred Alternative has been modified slightly from the DEIS-Supplement. These changes are highlighted throughout the remainder of this Chapter.

In the first decade, yearly average budget expenditures of $4,350,000 would produce outputs and activities that provide $1,266,000 in receipts to the U.S. Treasury and 953 private sector jobs. The present net value for the entire 150 year planning horizon is $215,770,000.

Departure Schedule

Alternative F and G have almost the same acres available for timber harvest--Alternative F has 286,000 and Alternative G has 282,000 acres. Because the land base available for harvest in Alternative G is only 2 percent less than in Alternative F, the analysis of the preferred departure on Alternative F could be applied to Alternative G. The timber harvest level would increase to 28.1 million board feet after the fourth decade and then decline to the long term sustained yield capacity of Alternative G, 23.8 million board feet, after the fifth decade.

Alternative H

Alternative H would significantly increase the opportunity for wilderness classification, while increasing commodity outputs from those lands that are presently developed.

Almost all inventoried roadless areas, 664,326 acres, would be recommended for wilderness classification. This would maximize the primitive recreation opportunity. There would be no timber harvested or motorized recreation in these areas. Valid mining claims and existing oil and gas leases would be managed under mineral laws and the Wilderness Act. Most oil and gas leases would not be reissued.

From other areas of the Forest, by the fifth decade 22.4 million board feet of timber would be offered for sale annually. Timber harvest would be programmed in areas that are presently developed on the Jefferson Division. Arterial and collector road construction would decrease, but local road construction would increase from the current direction. Livestock grazing would decrease from 71,000 to 64,800 AUMs. Wildlife habitat improvement would increase slightly to 496 acres annually. As as result of the habitat improvement and the acreage that would not be developed because of wilderness allocation, the elk population could increase by 300 animals. Developed recreation would increase about 32,000 RVDs, by the fifth decade.

Dispersed recreation opportunities in a roaded natural setting would remain constant. The Forest would continue to recommend no-surface occupancy, limited surface use, and timing restrictions on two-thirds of the acres in new and reissuance leases.

Deep Creek-Reservoir North would be designated as a further planning area.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,140,000 would produce outputs and activities that provide $1,467,000 in receipts to the U.S. Treasury and 1026 private sector jobs. The present net value for the entire 150 year planning horizon is $224,470,000.

Alternative I

Alternative I would increase the use of Forest resources, while providing diverse wildlife habitat and maintaining dispersed recreation opportunities in a primitive or semi-primitive setting.

About 235,704 acres of the land which has received high public interest, would be recommended for wilderness classification. These acres include most of the undeveloped lands on the Rocky Mountain Division and the Tenderfoot-Deep Creek area on the Jefferson Division. The wilderness allocation would increase the primitive recreation opportunity.

By the fifth decade, 22 million board feet of timber would be offered for sale annually. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small program of posts, poles, and firewood. Livestock grazing would increase from 71,000 AUMs to 73,600 AUMs, by the fifth decade. Wildlife habitat improvement would increase from the current direction to 703 acres annually. The elk population potential would be unchanged. Any adverse impacts on wildlife habitat from projects would be minimized through coordination and mitigation. No additional grazing would be planned on big-game winter range or

riparian zones, unless wildlife needs could be fully met. T&E species habitat would be maintained or improved. Developed recreation would increase about 32,000 RVDs, by the fifth decade.

The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases.

Most of the Bear-Marshall-Scapegoat-Swan, Silver King-Falls Creek, and Renshaw areas on the Rocky Mountain Division and the Tenderfoot-Deep Creek area on the Jefferson Division would be recommended for wilderness classification.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,170,000 would produce outputs and activities that provide $1,229,000 in receipts to the U.S. Treasury and 966 private sector jobs. The present net value for the entire 150 year planning horizon is $219,370,000.

Alternative J

Alternative J would recommend areas on the Forest with outstanding wilderness quality and little resource conflict for wilderness classification. These areas include parts of the Silver King-Falls Creek, Renshaw, and Tenderfoot-Deep Creek Roadless Areas.

Wilderness and primitive recreation would be increased. About 79,005 acres would be recommended for wilderness classification. In the areas recommended for wilderness, there would be no timber harvest or motorized recreation. Valid mining claims and existing oil and gas leases would be managed under mineral laws and the Wilderness Act. Oil and gas leases in areas recommended for wilderness classification would not be reissued.

Forest-wide by the fifth decade, 22 million board feet of timber would be offered for sale annually. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small sales program for local needs. Arterial and collector road construction would decrease from current direction, however, local road construction would increase. Livestock grazing would increase from 71,000 AUMs to 73,600 AUMs, by the fifth decade. Adverse impacts on wildlife habitat would be minimized through coordination and mitigation. Wildlife habitat improvement would increase to 700 acres a year. The increased habitat improvement and coordination during project planning will maintain the current elk population potential. No additional grazing would be planned on big-game winter range or riparian zones, unless wildlife needs could be fully met. Developed recreation would increase about 32,000 RVDs, by the fifth decade.

The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,180,000 would produce outputs and activities that provide $1,238,000 in receipts to the U.S. Treasury and 1061 private sector jobs. The present net value for the entire 150 year planning horizon is $218,860,000.

Alternative K

Alternative K would increase the Forest wildlife program, while maintaining dispersed recreation opportunities in a primitive or semi-primitive setting.

Areas of high public interest, totalling 387,106 acres, would be recommended for wilderness classification. This would increase the primitive recreation opportunity. There would be no timber harvest or motorized recreation in these lands.

Valid mining claims and existing oil and gas leases would be managed under mineral laws and the Wilderness Act. Oil and gas leases in areas recommended for wilderness classification would not be reissued.

About 12.4 million board feet of timber would be offered for sale annually. This is slightly less than the current level. Timber harvesting would be precluded in areas that are currently in a semi-primitive setting. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small program of post, poles, and firewood. Arterial and collector road construction would decrease from the current level, but local road construction would increase. Almost all of the road construction would be on the Jefferson Division. The capacity to winter big-game animals would be increased by tripling the wildlife habitat improvement program and by decreasing the livestock grazing to 69,900 AUMs, by the fifth decade. Also by the fifth decade, an additional 15,000 RVDs of developed recreation would be provided. Many semi-primitive recreation opportunities would be maintained. Additional oil and gas leasing with surface occupancy would be recommended only on areas which are currently accessible and which are not extremely sensitive to development. To protect wildlife, timing restrictions would be recommended on most new oil and gas leases. Existing leases would not be changed.

The Bear-Marshall-Scapegoat-Swan, Silver King-Falls Creek, and Renshaw areas on the Rocky Mountain Division and the Tenderfoot-Deep Creek, Pilgrim Creek, Crazy Mountain, and Big Baldy areas on the Jefferson Division would be recommended for wilderness classification.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,130,000 would produce outputs and activities that provide $1,186,000 in receipts to the U.S. Treasury and 960 private sector jobs. The present net value for the entire 150 year planning horizon is $200,140,000.

Forest-wide by the fifth decade, 22 million board feet of timber would be offered for sale annually. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small sales program for local needs. Arterial and collector road construction would decrease from current direction, however, local road construction would increase. Livestock grazing would increase from 71,000 AUMs to 73,600 AUMs, by the fifth decade. Adverse impacts on wildlife habitat would be minimized through coordination and mitigation. Wildlife habitat improvement would increase to 700 acres a year. The increased habitat improvement and coordination during project planning will maintain the current elk population potential. No additional grazing would be planned on big-game winter range or riparian zones, unless wildlife needs could be fully met. Developed recreation would increase about 32,000 RVDs, by the fifth decade.

The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,180,000 would produce outputs and activities that provide $1,238,000 in receipts to the U.S. Treasury and 1061 private sector jobs. The present net value for the entire 150 year planning horizon is $218,860,000.

Alternative K

Alternative K would increase the Forest wildlife program, while maintaining dispersed recreation opportunities in a primitive or semi-primitive setting.

Areas of high public interest, totalling 387,106 acres, would be recommended for wilderness classification. This would increase the primitive recreation opportunity. There would be no timber harvest or motorized recreation in these lands.

Valid mining claims and existing oil and gas leases would be managed under mineral laws and the Wilderness Act. Oil and gas leases in areas recommended for wilderness classification would not be reissued.

About 12.4 million board feet of timber would be offered for sale annually. This is slightly less than the current level. Timber harvesting would be precluded in areas that are currently in a semi-primitive setting. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small program of post, poles, and firewood. Arterial and collector road construction would decrease from the current level, but local road construction would increase. Almost all of the road construction would be on the Jefferson Division. The capacity to winter big-game animals would be increased by tripling the wildlife habitat improvement program and by decreasing the livestock grazing to 69,900 AUMs, by the fifth decade. Also by the fifth decade, an additional 15,000 RVDs of developed recreation would be provided. Many semi-primitive recreation opportunities would be maintained. Additional oil and gas leasing with surface occupancy would be recommended only on areas which are currently accessible and which are not extremely sensitive to development. To protect wildlife, timing restrictions would be recommended on most new oil and gas leases. Existing leases would not be changed.

The Bear-Marshall-Scapegoat-Swan, Silver King-Falls Creek, and Renshaw areas on the Rocky Mountain Division and the Tenderfoot-Deep Creek, Pilgrim Creek, Crazy Mountain, and Big Baldy areas on the Jefferson Division would be recommended for wilderness classification.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,130,000 would produce outputs and activities that provide $1,186,000 in receipts to the U.S. Treasury and 960 private sector jobs. The present net value for the entire 150 year planning horizon is $200,140,000.

Forest-wide by the fifth decade, 22 million board feet of timber would be offered for sale annually. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small sales program for local needs. Arterial and collector road construction would decrease from current direction, however, local road construction would increase. Livestock grazing would increase from 71,000 AUMs to 73,600 AUMs, by the fifth decade. Adverse impacts on wildlife habitat would be minimized through coordination and mitigation. Wildlife habitat improvement would increase to 700 acres a year. The increased habitat improvement and coordination during project planning will maintain the current elk population potential. No additional grazing would be planned on big-game winter range or riparian zones, unless wildlife needs could be fully met. Developed recreation would increase about 32,000 RVDs, by the fifth decade.

The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,180,000 would produce outputs and activities that provide $1,238,000 in receipts to the U.S. Treasury and 1061 private sector jobs. The present net value for the entire 150 year planning horizon is $218,860,000.

Alternative K

Alternative K would increase the Forest wildlife program, while maintaining dispersed recreation opportunities in a primitive or semi-primitive setting.

Areas of high public interest, totalling 387,106 acres, would be recommended for wilderness classification. This would increase the primitive recreation opportunity. There would be no timber harvest or motorized recreation in these lands.

Valid mining claims and existing oil and gas leases would be managed under mineral laws and the Wilderness Act. Oil and gas leases in areas recommended for wilderness classification would not be reissued.

About 12.4 million board feet of timber would be offered for sale annually. This is slightly less than the current level. Timber harvesting would be precluded in areas that are currently in a semi-primitive setting. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small program of post, poles, and firewood. Arterial and collector road construction would decrease from the current level, but local road construction would increase. Almost all of the road construction would be on the Jefferson Division. The capacity to winter big-game animals would be increased by tripling the wildlife habitat improvement program and by decreasing the livestock grazing to 69,900 AUMs, by the fifth decade. Also by the fifth decade, an additional 15,000 RVDs of developed recreation would be provided. Many semi-primitive recreation opportunities would be maintained. Additional oil and gas leasing with surface occupancy would be recommended only on areas which are currently accessible and which are not extremely sensitive to development. To protect wildlife, timing restrictions would be recommended on most new oil and gas leases. Existing leases would not be changed.

The Bear-Marshall-Scapegoat-Swan, Silver King-Falls Creek, and Renshaw areas on the Rocky Mountain Division and the Tenderfoot-Deep Creek, Pilgrim Creek, Crazy Mountain, and Big Baldy areas on the Jefferson Division would be recommended for wilderness classification.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,130,000 would produce outputs and activities that provide $1,186,000 in receipts to the U.S. Treasury and 960 private sector jobs. The present net value for the entire 150 year planning horizon is $200,140,000.

Forest-wide by the fifth decade, 22 million board feet of timber would be offered for sale annually. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small sales program for local needs. Arterial and collector road construction would decrease from current direction, however, local road construction would increase. Livestock grazing would increase from 71,000 AUMs to 73,600 AUMs, by the fifth decade. Adverse impacts on wildlife habitat would be minimized through coordination and mitigation. Wildlife habitat improvement would increase to 700 acres a year. The increased habitat improvement and coordination during project planning will maintain the current elk population potential. No additional grazing would be planned on big-game winter range or riparian zones, unless wildlife needs could be fully met. Developed recreation would increase about 32,000 RVDs, by the fifth decade.

The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,180,000 would produce outputs and activities that provide $1,238,000 in receipts to the U.S. Treasury and 1061 private sector jobs. The present net value for the entire 150 year planning horizon is $218,860,000.

Alternative K

Alternative K would increase the Forest wildlife program, while maintaining dispersed recreation opportunities in a primitive or semi-primitive setting.

Areas of high public interest, totalling 387,106 acres, would be recommended for wilderness classification. This would increase the primitive recreation opportunity. There would be no timber harvest or motorized recreation in these lands.

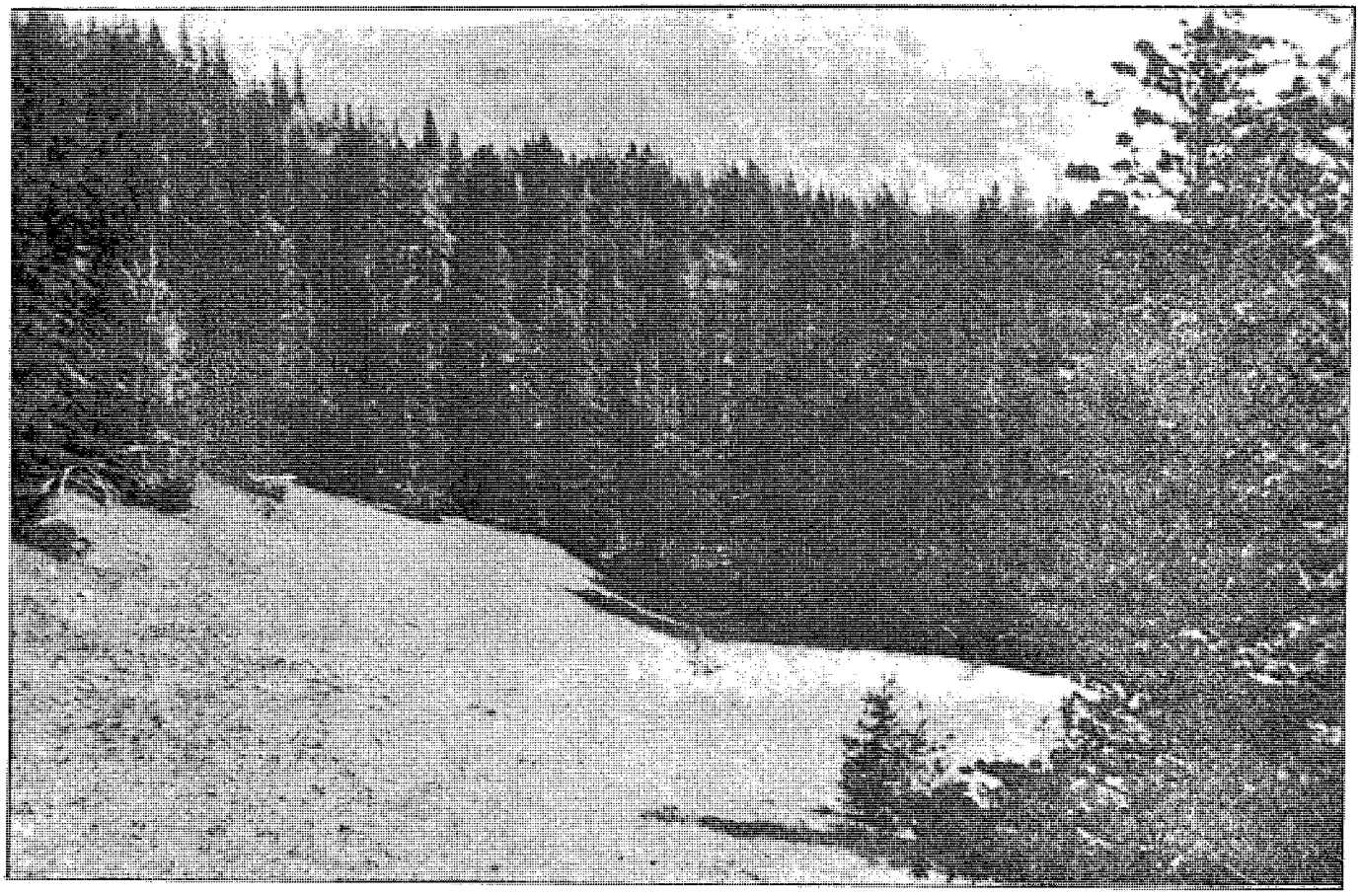
Valid mining claims and existing oil and gas leases would be managed under mineral laws and the Wilderness Act. Oil and gas leases in areas recommended for wilderness classification would not be reissued.

About 12.4 million board feet of timber would be offered for sale annually. This is slightly less than the current level. Timber harvesting would be precluded in areas that are currently in a semi-primitive setting. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small program of post, poles, and firewood. Arterial and collector road construction would decrease from the current level, but local road construction would increase. Almost all of the road construction would be on the Jefferson Division. The capacity to winter big-game animals would be increased by tripling the wildlife habitat improvement program and by decreasing the livestock grazing to 69,900 AUMs, by the fifth decade. Also by the fifth decade, an additional 15,000 RVDs of developed recreation would be provided. Many semi-primitive recreation opportunities would be maintained. Additional oil and gas leasing with surface occupancy would be recommended only on areas which are currently accessible and which are not extremely sensitive to development. To protect wildlife, timing restrictions would be recommended on most new oil and gas leases. Existing leases would not be changed.

The Bear-Marshall-Scapegoat-Swan, Silver King-Falls Creek, and Renshaw areas on the Rocky Mountain Division and the Tenderfoot-Deep Creek, Pilgrim Creek, Crazy Mountain, and Big Baldy areas on the Jefferson Division would be recommended for wilderness classification.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,130,000 would produce outputs and activities that provide $1,186,000 in receipts to the U.S. Treasury and 960 private sector jobs. The present net value for the entire 150 year planning horizon is $200,140,000.



Cottonwood Canyon Parks, used for Elk Bedding Grounds.

TABLE S-1 SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE AND BENCHMARK LEVEL (Average Annual Output)

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	MIN LEVEL	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D
Rec. Use Potential by 2030	Thousand RVDs								
(Base Year 1984 in parentheses)									
--Rural	(194)	194	194	194	194	194	194	194	194
--Roaded Natural	(1905)	1905	2119	2303	2326	2178	2200	2094	2116
--Semi-Primitive	(223)	223	193	153	170	158	175	211	205
--Primitive	(47)	47	52	84	52	84	52	52	52
--Developed	(198)	0	198	230	230	198	198	213	230
Rec. Setting by 2030	Thousand Acres								
(Base Year 1984 in parentheses)									
--Primitive	(384)	384	448	637	448	637	448	448	448
--Semi-Primitive	(992)	992	762	328	328	206	407	814	710
--Roaded Natural	(450)	450	616	861	1050	983	971	564	668
--Rural	(17)	17	17	17	17	17	17	17	17
Visual Quality Objectives by 2030	Thousand Acres								
--Preservation		448	448	637	448	637	448	448	448
--Retention		42	231	42	42	42	42	42	42
--Partial Retention		1353	573	394	429	338	444	824	826
--Modification		0	591	770	924	826	909	529	527
Wilderness									
--Existing	Thousand Acres	384	384	384	384	384	384	384	384
--Recommended		0	64	253	64	253	64	64	64
Roadless									
--1994		1002	913	708	897	724	913	923	925
--2030		1002	675	337	336	263	476	792	736
--2130		1002	531	59	58	120	255	730	676
Wildlife									
--Habitat Improvement	Acres or Structures								
--1984-1990		0	466	1162	1248	426	444	1228	452
--2021-2030		0	466	1138	1236	410	440	1228	440
--Elk Population Potential	Number								
--1984-1990		8500	8500	8500	8500	8500	8500	8500	8500
--2021-2030		10000	8500	8100	8000	8300	8200	9300	7800
--Elk Hunter Days	Thousand Hunter Days								
--1984-1990		65.0	63.9	63.9	63.3	63.9	63.9	63.9	62.9
--2021-2030		82.8	63.9	50.4	51.6	56.3	56.3	71.9	56.9
--Catchable Trout Potential	Thousand Fish								
--1984-1990		202	202	202	202	202	202	202	202
--2021-2030		212	202	167	174	186	186	208	170
Range	Thousand AUMs								
--1984-1990		71.0	71.0	73.0	73.0	73.0	73.0	71.1	73.0
--2021-2030		0	71.0	86.4	87.5	81.4	81.5	70.0	89.9
Timber									
--Suitable Land	Thousand Acres	0	196	473	542	453	466	209	227
--Timber Sale Program	Million Board Ft.								
--1984-1990		0	13.0	20.0	20.0	14.0	14.0	12.5	12.5
--2021-2030		0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
--Long Term Sustained Yield	Million Board Ft.	0	14.3	41.1	43.5	32.6	33.6	18.3	16.0
Soil and Water									
--Increase in Sediment Yield over Natural Level	Thousand Tons/Year								
--1984-1990		2.4	3.8	4.6	4.9	4.1	4.7	3.9	3.8
--2021-2030		0	2.9	7.8	6.5	4.3	4.3	2.9	3.4
--Water Quantity	Thousand Acre Feet/Year								
--1984-1990		1700	1700	1700	1700	1700	1700	1700	1700
--2021-2030		1698	1700	1720	1720	1710	1710	1700	1700

TABLE S-1 SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE AND BENCHMARK LEVEL (Average Annual Output)

ALT E-1	ALT E-2	ALT F	ALT F (Depart)	ALT G (Prefer)	ALT H	ALT I	ALT J	ALT K	MAX PNV
194	194	194	194	194	194	194	194	194	194
2248	2269	2202	2232	2134	1938	2099	2146	1965	2521
160	171	185	179	183	55	166	184	138	164
84	52	52	52	54	203	78	59	118	47
203	203	230	230	230	230	230	230	213	198
637	448	448	448	436	1049	619	463	772	384
299	430	845	600	867	319	613	741	569	150
890	948	533	778	523	458	594	622	485	1292
17	17	17	17	17	17	17	17	17	17
637	448	452	452	439	1049	619	463	772	384
42	42	42	42	42	42	42	42	42	42
453	470	833	588	839	294	588	716	544	167
711	883	516	761	452	458	594	622	485	1250
384	384	384	384	384	384	384	384	384	384
253	64	64	64	52	664	235	79	387	0
724	913	913	911	944	338	754	908	607	872
332	449	716	714	857	319	649	777	510	0
282	285	716	714	857	319	649	777	510	0
			698	850	498	704	702	853	136
728	746	698	678	830	496	703	701	863	138
716	718	678							
			8500	8500	8500	8500	8500	8500	8500
8500	8500	8500	8400	8500	8800	8500	8500	9200	8600
8200	8100	8400							
			63.9	63.7	63.0	63.4	63.7	63.9	63.9
63.5	63.9	63.9	57.3	60.2	67.0	61.2	60.5	71.9	53.7
55.0	53.0	60.1							
			202	202	202	202	202	202	202
202	202	202	190	202	204	202	202	208	186
192	192	190							
			71.8	71.1	71.1	71.8	71.8	71.1	26.7
71.8	71.8	71.8	79.2	73.6	64.8	73.6	73.6	69.9	33.5
84.4	84.7	79.2							
			309	282	255	281	281	202	640
434	534	286							
14.0	14.0	14.0							
33.1	34.0	24.0	15.5	14.0	14.7	13.0	13.0	12.4	24.0
34.6	38.8	25.4	26.6	20.0	22.4	22.0	22.0	12.4	69.5
			26.2	23.8	23.7	20.3	20.3	14.4	43.8
4.1	4.2	4.1	4.7	3.8	3.9	3.8	3.8	3.8	4.3
5.5	5.4	4.3	5.2	3.4	3.7	3.3	3.3	2.7	7.4
1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
1720	1720	1710	1710	1710	1710	1710	1710	1700	1730

TABLE S-1 SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE AND BENCHMARK LEVEL (Average Annual Output)

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	MIN LEVEL	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D
Minerals									
--Effects on Current Oil and Gas Leases and Lease Applications	Thousand Acres								
--Category A 2/		0	448	632	448	632	448	448	448
--Category B		0	328	328	328	328	328	328	238
--Category C		0	248	0	0	53	248	748	248
--Category D		0	819	883	1067	723	819	329	819
--Effects on Metallics and other Minerals	Thousand Acres								
--Category A		0	448	637	448	637	448	448	448
--Category B		0	328	328	328	328	328	328	328
--Category C		0	197	190	197	190	197	197	197
--Category D		0	870	688	870	688	870	870	870
Roads and Trails									
--Arterial and Collector Roads Construction	Miles								
--1984-1990		0	4.5	4.2	5.2	4.5	4.5	4.5	4.5
--2021-2030		0	5.1	17.9	19.1	5.4	10.1	3.8	3.8
--Local Road Construction	Miles								
--1984-1990		0	12.5	21.0	22.9	16.2	17.6	15.3	10.7
--2021-2030		0	10.7	33.8	36.1	29.3	24.8	12.0	10.2
--Trail Construction/Recon.	Miles	0	0	1.5	1.5	.8	0	2.0	2.0
Total Prescribed Fire (Average Annual)	Acres	0	2966	6291	6562	4272	4349	3476	3781
Social/Economic	Person/Years								
--changes in employment									
--1984-1990		-246	0	186	186	24	23	1	1
--2021-2030		-575	0	588	588	254	228	-6	17
Returns to U.S. Treasury 3/	Million Dollars								
--1984-1990		.40	1.19	1.72	1.94	1.27	1.39	1.19	1.33
--2021-2030		.40	4.26	11.92	14.73	9.12	9.88	4.32	4.43
Total Budget required to implement 3/	Million Dollars								
--1984-1990		2.67	3.89	4.98	4.82	4.10	4.16	4.11	4.07
--2021-2030		2.60	4.03	8.51	7.42	5.00	5.24	4.18	4.71
Present Value Benefits 3/ --at 4%	Million Dollars	204.31	382.30	681.83	702.90	544.43	550.30	393.20	404.24
Present Value Costs 3/ --at 4%	Million Dollars	77.31	199.69	400.93	446.09	301.83	315.10	212.91	219.77
Present Net Value 3/	Million Dollars								
--at 4%		127.00	182.62	280.89	256.80	242.62	235.20	180.30	184.47
--at 7-1/8%		60.82	82.24	93.31	101.61	100.27	96.54	77.35	80.58

2/ - Category A - lands withdrawn or proposed for withdrawal for mineral entry.
Category B - lands where laws or executive orders require specific protection or mitigation measures.
Category C - lands where special mitigation measures are required by the Regional Forester.
Category D - lands where standard lease stipulations apply.
3/ - Values given in 1978 dollars.

TABLE S-1 SUMMARY OF TOTAL RESOURCE PRODUCTION BY ALTERNATIVE AND BENCHMARK LEVEL (Average Annual Output)

ALT E-1	ALT E-2	ALT F	ALT F (Depart)	ALT G (Prefer)	ALT H	ALT I	ALT J	ALT K	MAX PNV
632	448	448	448	436	1049	620	463	771	384
328	328	328	328	340	203	245	363	203	394
0	0	248	248	197	122	580	623	247	0
863	1067	819	819	872	290	398	394	622	1065
			448	436	1049	619	463	772	384
637	448	448	328	340	203	245	362	203	392
328	328	328	197	197	148	183	190	182	197
190	197	197	870	870	443	796	828	686	870
688	870	870							
4.5	4.5	4.5	5.2	3.6	3.6	3.6	3.6	1.7	5.2
6.5	17.4	4.8	10.1	2.0	2.0	2.5	2.0	1.4	47.0
16.0	17.1	14.1	19.8	13.0	13.0	12.9	12.9	12.4	26.1
33.2	34.8	14.6	17.7	14.8	21.7	13.2	12.9	7.8	57.9
2.0	1.8	2.0	2.0	10.0	5.0	5.0	5.0	2.0	0
5268	5295	4509	4326	3787	2695	3731	3727	2807	5845
16	13	23	34	7	80	20	115	14	94
422	403	260	196	129	123	199	232	-15	675
1.31	1.43	1.19	1.35	1.27	1.47	1.23	1.24	1.19	1.99
12.04	14.36	7.42	8.40	7.06	7.45	2.25	7.47	4.48	19.63
4.21	4.23	4.62	4.94	4.35	4.14	4.17	4.18	4.13	4.49
5.62	6.49	5.61	6.40	5.15	5.25	4.99	4.98	4.09	8.62
574.10	593.40	528.45	559.38	475.80	490.81	479.63	478.84	408.41	868.18
311.70	350.92	278.41	329.79	260.04	266.33	260.26	259.98	208.28	560.17
262.41	242.48	223.04	229.60	215.77	224.47	219.37	218.86	200.14	308.01
100.87	101.30	88.41	74.36	93.78	97.60	94.91	92.66	90.41	112.70

AFFECTED ENVIRONMENT

FOREST ACREAGE

The gross area within the boundaries of the Lewis and Clark National Forest is 1,999,022 acres (National Forest System Areas Report, FY 1982). Approximately 1,843,397 acres are administered by the Forest Service in large consolidated blocks.

Private Land

Private lands account for 155,625 acres of the gross area. The west edge of the Little Belt Mountains and the north side of the Crazy Mountains contain large areas of intermingled private lands.

GENERAL TOPOGRAPHY

Topography varies from the steep, rugged, and precipitous slopes of the Rocky and Big Snowy Mountains to the gently, rolling, and broad plateaus of the Castles and Little Snowy Mountains.

Jefferson Division

Jefferson Division's mountain ranges are dome-like with smooth, rounded tops flanked by valleys. The Big Snowy, Little Snowy, and eastern end of the Castle Mountains were formed from uplifted, tilted limestone beds.

The west end of the Castle Mountains were formed by a dome of intrusive igneous rock injected into older, uplifted limestone beds.

The Crazy and Highwood Mountains consist of volcanic rock. The Little Belt Mountains have an igneous rock core; sandstone and shale are exposed on the higher ridges. The north and south facing slope of the Little Belts are uplifted and tilted limestone beds.

Rocky Mountain Division

Locally, the Rocky Mountains resulted from extensive overthrusting and faulting of sedimentary rock. They have very steep ridges and narrow valleys consisting of alternating layers of hard limestone, or dolomite, and softer sandstone and shale. The dolomite forms the ridges, with the softer shales and sandstones underlying the valleys. The spectacular peaks and steep ridges are the result of alpine glaciation.

CLIMATE

The Forest's climate varies from cool and semi-arid to cold and humid. Precipitation ranges from 14 inches annually on the lower slopes of the Jefferson Division to 65 inches on the highest ridges in the Rockies. Fifty to 80 percent of this moisture occurs as snow. The growing season for native plants is limited by moisture on low elevation lands and by cold temperatures at higher elevations.

AFFECTED ENVIRONMENT

An important climatic factor at all elevations is the frequent strong winds. Chinook winds during the winter cause dramatic temperature changes, as much as 50 degrees in one hour.

VEGETATION

Eighty-five percent of the Forest is covered by trees. The remaining 15 percent contains many beautiful grass parks and mountain meadows plus numerous rocky ridges and pearks.

VISUAL SETTING

The beauty of a tree-covered mountainside or meadows interspersed with trees is one of many assets to be found in the forested mountains of the Lewis and Clark. Each mountain range has its own unique visual setting.

BLACKFEET TREATY RIGHTS

The northern part of the Rocky Mountain District was once a part of the Blackfeet Indian Reservation. The Blackfeet Indian Nation retains certain rights on these lands under the Treaty Rights Agreement of 1896.

TENDERFOOT EXPERIMENTAL FOREST

In 1961, the 9,125 acre Tenderfoot Experimental Forest in the Little Belt Mountains, was established. Since establishment of the Experimental Forest, development has been minimal.

RESEARCH NATURAL AREAS

Research natural areas are ecological reference points or experimental controls. One area, Paine Gulch near Monarch in the Little Belts, has been recommended as a research natural area.

DEVELOPED RECREATION

Recreation is one of the major Forest uses. The Forest has 29 developed recreation sites, occupying 195 acres. These sites can provide 198,500 RVDs (based on optimum use at 40 percent of design capacity during the managed season). The developed use in 1984 was 66,000 RVDs.

The Forest administers 178 summer home sites, under special-use permits. In addition, the private sector can provide 56,100 RVDs of downhill skiing at two ski areas and 33,500 RVDs of use at five resorts and one organization camp.

DISPERSED RECREATION

The Forest provides a wide range of dispersed recreation -- hiking, camping, backpacking, fishing, hunting, off-road vehicle use, cross-country skiing, horse back riding, birding, photography, wilderness use, and nature study. These activities take place in all recreation settings.

AFFECTED ENVIRONMENT

Many activities are centered around the Forest trail system. Pleasure driving, hunting, camping, snowmobiling, and hiking (in that order) are the most popular activities. Current available dispersed recreation opportunity on the Forest is 2,369,000 RVDs. The use in 1984 was estimated to be 534,100 RVDs.

VISUAL QUALITY

The current visual quality objectives are:

Preservation (448,000 acres)
- -- Classified Wilderness
- -- RARE II Recommended Wilderness

Retention (231,000 acres)
- -- RARE II Further Planning and MWSA areas
- -- Campgrounds and Ski Areas

Partial Retention (573,000 acres)
- -- Major roads and trails (includes rural and semi-primitive recreation settings) as defined in Forest Supervisor's Oct. 1980 memo, 1920, Classification Criteria for Major Roads

Modification (591,000 acres)
- -- All other land

CULTURAL PROPERTIES

The Lewis and Clark National Forest contains numerous significant cultural properties of both the prehistoric and historic eras, although relatively few sites have been located to date.

WILDERNESS

A 384,407 acre portion of the Bob Marshall-Great Bear-Scapegoat Wilderness complex is along the Continental Divide in the Rocky Mountain Division. Estimated 1984 wilderness use was 69,500 RVDs. Another 813,347 acres in 24 separate roadless areas are available for wilderness classification.

WILDLIFE AND FISH

The Forest's variety of terrain and vegetation provide habitat for 290 wildlife and fish species. This is among the most diverse and important habitat in the Northern Region.

THREATENED AND ENDANGERED SPECIES

Habitat has been identified on Lewis and Clark National Forest for threatened and endangered species as listed by the U.S. Fish and Wildlife Service; grizzly bear, gray wolf, bald eagle, and peregine falcon.

AFFECTED ENVIRONMENT

LIVESTOCK GRAZING	Livestock grazing is a major use on 220,000 acres of grass, shrub, and forest land. Most grazing is under paid permit to 230 local ranchers, the permittees. The Forest is grazed for summer range by 27,500 head of stock (70,700 AUMs).
TIMBER	For 100 years, the Forest's timber harvest has been a major contribution to central Montana's development and welfare. The current timber sale program is 13 million board feet per year on a 554,215 acre land base.
WATER	In-stream use of Forest water includes hydroelectric power generation, preservation of fish and riparian habitat, and recreation. Irrigation takes much of the available water in the mid- and late summer months. Most irrigation water comes from the Musselshell, Judith, North Fork Smith, Sun, Two Medicine, and Teton Rivers and associated reservoirs. O'Brien Creek and Willow Creek are municipal watersheds that provide water for domestic use.
AIR	Air quality is excellent with no direct point source problems and only occasional regional haze in late summer primarily from forest fires in western Montana or in Canada.
MINERALS-OIL AND GAS	The Lewis and Clark National Forest lies within the geologic structure known as the Overthrust Belt. This zone contains many likely source rocks for trapped oil and gas accumulations. The highest potential areas occur throughout the Rocky Mountain Division and in portions of the Jefferson Division; specifically, the Crazy Mountains and areas adjacent to the Castle Mountains. Based on previous environmental analyses, 413,516 acres of the Forest have been leased or recommendations have been made. Extensive preliminary exploration work has been done but little exploratory drilling. The Bob Marshall-Scapegoat-Great Bear Wilderness complex was withdrawn from mineral entry on January 1, 1984.
MINERALS-METALLICS AND OTHER MINERALS	The Jefferson Division has a history of silver, zinc, lead, copper, iron, sapphire, and gold production. Production was mostly from small mines which produced intermittently until the 1950s. Prospecting and mineral exploration takes place continually and can be expected to increase in the future.

AFFECTED ENVIRONMENT

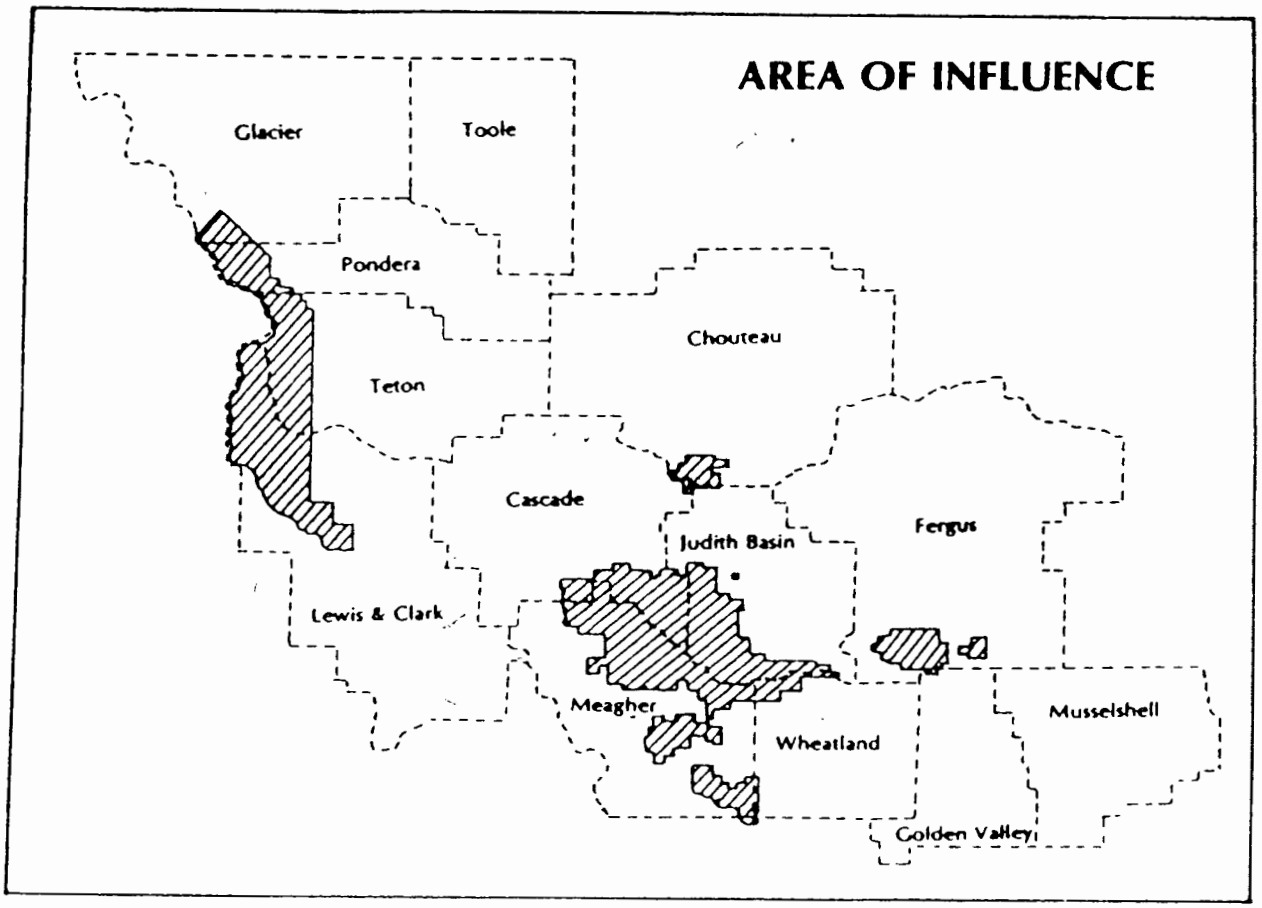
SOILS	A Forest landtype survey has been completed. This survey describes the soils, climax vegetation (habitat type), and landforms found on this Forest and their suitability for the more commonly applied land management practices. Management-made erosion causing water pollution has been identified on 373 acres. Restoration of this erosion is to be completed by the year 2000.
LANDS	National Forest land is generally available for occupancy if such occupancy is in the public interest. Occupancy takes place through issuance of special-use permits. Over 380 special-use permits have been issued on the Forest. The Forest lacks rights-of-way on many roads and most trails that cross private land. Lack of public access to the Forest and the intermingling of public and private lands within the Forest boundary creates a variety of problems. The Forest has several transportation and utility corridors.
FACILITIES-ROADS AND TRAILS	The inventoried road system consists of 155 miles of arterial roads, 643 miles of collector roads, and 597 miles of local roads (Transportation Inventory System, 1982). An estimated 600 miles of primitive roads are not on the inventory. Many other Federal, State, and County roads also provide access to the Forest. The trail system has 1,677 miles of managed trails. The Forest has seven National Recreation Trails and a portion of the Continental Divide National Scenic Trail.
PROTECTION-FIRE MANAGEMENT	Wildfire burned an average of 492 acres per year on the Forest from 1970-79, at a suppression cost of about $208,000 per year. Over 70 percent of this loss occurred in the lodgepole pine type of the Little Belt Mountains.
PROTECTION-LAW ENFORCEMENT	The Lewis and Clark National Forest recognizes that the statutory responsibility of the Forest Service for law enforcement is an integral part of all functions associated with the multiple-use concept in land management.
PROTECTION-INSECT AND DISEASE	Four insects and two diseases are the most damaging agents to the Forest's trees. The mountain pine beetle presents the most serious threat to lodgepole pine.

AFFECTED ENVIRONMENT

AREA OF INFLUENCE

While the Forest provides resources to the region and to the nation, the local area-of-influence includes 13 central Montana counties. Approximately 185,000 people live in this area. This area-of-influence encompasses those people who depend on the Forest resources and who use it on a regular basis. Major communities include Great Falls, Lewistown, Harlowton, White Sulphur Springs, Choteau, Stanford, and Browning. A variety of lifestyles exist throughout these counties.

In Cascade County, over 90 percent of the residents live in Great Falls, while the other counties have mostly rural populations. People living closest to the Forest use more of the market-valued resources, by logging, grazing, and mining. All the communities use the Forest for recreation.



ENVIRONMENTAL CONSEQUENCES

Current Plan	The Current Plan, with no increase in range and timber outputs, would not significantly affect the physical and biological environment. Roading of undeveloped lands would forego semi-primitive recreation opportunities, although this roading would benefit those people who enjoy motorized recreation. Recommendations on oil and gas leases would include standard and special stipulations to protect surface resources.
Alternative A	Alternative A would cause the greatest change in the environment. Direct effects on the physical environment would include increased sedimentation and reduced water quality, because of increased timber harvesting and grazing in the riparian zones. Wildlife would be adversely impacted, especially big game. A loss in wildlife population would indirectly affect the social and economic environment by reducing the amount and quality of recreation associated with wildlife, especially the economic benefits associated with big game hunting. Much of the undeveloped land would be roaded. The increased roading would benefit these people who enjoy motorized recreation. Foregone semi-primitive recreation opportunities would be a long term effect of this roading. An increase in timber and range production would have a beneficial effect on the surrounding communities by increasing income and employment in those communities. Alternative A would maximize the exploration and development of potential gas and oil reserves.
Alternative B	Alternative B would have significant effects on the biological, social, and economic environments. Big game and other wildlife populations would decrease. Along with this wildlife decrease would be a loss in recreation and hunting opportunities and the economic benefits from big game hunting. These decreases are greater than the Current Plan but less than Alternative A. The moderate increases in commodity production would benefit local communities through increased employment and income. Many semi-primitive recreation opportunities would be foregone because of the roading of undeveloped lands. Increased roading would benefit those people who enjoy motorized recreation. Alternative B continues to use the current method of processing oil and gas lease applications.

Alternative C	Alternative C would cause the least change in the physical and biological environment. The slight decrease in livestock grazing would improve habitat for big game, especially on winter ranges. This decrease in grazing would have a slight adverse economic impact on ranching communities. Other economic benefits to surrounding communities would not change significantly because commodities such as timber remain at slightly below the current level. Large areas would be retained for semi-primitive recreation which would benefit those people who enjoy this type of recreation. Alternative C would provide less opportunity for oil and gas exploration and development because semi-primitive recreation areas would be protected by non-surface occupancy stipulations on all new leases.
Alternative D	Alternative D would have significant impacts on some biological and economic environments. The increase in livestock grazing would benefit those people and communities that depend on ranching by increasing job opportunities and income. However, big-game populations would decrease because of livestock grazing increases on important winter range. The decrease in big game populations would have adverse social and economic effects by decreasing recreation opportunities associated with wildlife. Timber harvest would be slightly below current level. Alternative D would provide less opportunity for oil and gas exploration and development because semi-primitive recreation areas would be protected by non-surface occupancy stipulations on all new leases.
Alternative E	Alternative E would have significant impacts on the Jefferson Division. Under this alternative, no regulated timber would be harvested in the Rocky Mountain Division. Effects on the Jefferson Division would be similar to Alternative A and similar to C on the Rocky Mountain Division.
Alternative F	Alternative F would benefit the surrounding communities by increasing employment and income through increased grazing and timber harvest. These increases would also provide a greater share of regional and national needs. However, these increases are not as great as in Alternatives A, B, and E. Big game populations and other wildlife populations would decrease slightly compared to

	the Current Plan. These decreases would have some effect on the recreational opportunities associated with wildlife and the economic benefit of big game hunting. Most of the semi-primitive recreation opportunities would be retained, which would benefit those people who enjoy that type of recreation. While total acres in this setting are higher than the Current Plan, the semi-primitive recreation visitor days are slightly lower than Current Plan because of the location of timber harvest acres in this alternative. Alternative F continues to use the current method of processing oil and gas lease applications.
Alternative F Departure	Like Alternative F, Alternative F (Departure) would have beneficial impacts on the surrounding communities by increasing employment and income through increased grazing and timber harvest. These increases would also provide a greater share of regional and national needs. These increases are also not as great as in Alternatives A, B, and E although they would occur early in the planning period. Big game populations and other wildlife populations would decrease slightly when compared with the Current Plan. These decreases would have some effect on the recreational opportunities associated with wildlife and economic benefit of big game hunting. Some semi-primitive recreation opportunities would be foregone because of roading undeveloped lands. Alternative F (Departure) continues to use the current method of processing oil and gas lease applications.
Alternative G Preferred	Alternative G (Preferred) would have some beneficial impacts on the surrounding communities by increasing employment and income through increased timber harvest. These increases would also provide a greater share of regional and national timber needs. However, these increases are not as great as in Alternatives A, B, E, and F. The small increase in grazing will have little effect employment or income. Big game populations and other wildlife populations would be maintained when compared with the Current Plan. This will help maintain the recreational opportunities associated with wildlife and the economic benefit of big game hunting. Alternative G recommends wilderness classification on the least amount of acres - 51,834. Most of the semi-primitive recreation opportunities would be retained, which would benefit those people who enjoy that type of recreation.

	Alternative G continues to use the current method of processing oil and gas lease applications.
Alternative H	Like Alternative G (Preferred), Alternative H would have some beneficial impact on the surrounding communities by increasing employment and income through increased timber harvest. This increase is slightly more than Alternative G (Preferred). The decrease in grazing would have an adverse economic impact on some surrounding communities. Big game and trout population would increase when compared with the Current Plan. This would increase the recreational opportunities associated with wildlife and the economic benefits of big game hunting. Most roadless areas would be recommended for wilderness classification. This would triple the primitive recreation opportunity and provide security for wildlife and fish from development and disturbance. Most semi-primitive motorized opportunities would be foregone. Alternative H would provide the least opportunity for oil and gas exploration and development because of wilderness classification. On other areas Alternative H continues to use the current method of processing oil and gas lease applications.
Alternative I	Alternative I would have some beneficial impact on the surrounding communities by increasing employment and income through increased timber harvest. This increase is similar to Alternative G (Preferred). The small increase in grazing would have little effect on employment or income. Big-game populations and other wildlife populations would be maintained when compared with the Current Plan. This will help maintain the recreational opportunities associated with wildlife and the economic benefits of big game hunting. Much of the roadless land on the Rocky Mountain Division and in the Tenderfoot-Deep Creek area on the Jefferson Division would be recommended for wilderness classification. This would increase the primitive recreation opportunity. Many semi-primitive recreation opportunities would also be maintained. Alternative I would provide less opportunity for oil and gas exploration and development because of wilderness classification. On other areas Alternative I continues to use the current method of processing oil and gas lease applications.

Alternative J	Like Alternative G (Preferred) and I, Alternative J would have some benefit on the surrounding communities through increased timber harvest. Grazing and wildlife effects are also similar. These areas (on the Rocky Mountain Division and on the Jefferson Division) would be recommended for wilderness classification. Most semi-primitive recreation opportunities would be maintained. Alternative J would increase the opportunity for oil and gas exploration and development on the Renshaw and Falls Creek areas. Alternative J would continue to use the current method of processing oil and gas lease applications.
Alternative K	Like Alternative C, Alternative K would cause less change in the physical and biological environment. The slight decrease in livestock grazing would improve habitat for big game, especially on winter range. This decrease in grazing would have a slight adverse economic impact on ranching communities. Other economic benefits to surrounding communities would not change significantly because commodities such as timber remain at slightly below the current level. Like Alternative I, Alternative K would recommend most of the roadless land on the Rocky Mountain Division and the Tenderfoot-Deep Creek area on the Jefferson Division for wilderness classification. In addition, the Pilgrim Creek, Big Baldy, and Crazy Mountains roadless areas in the Jefferson Division would be recommended for wilderness classification. This would almost double the wilderness opportunity on the Forest. Many semi-primitive recreational opportunities would also be maintained. Alternative K would provide less opportunity for oil and gas exploration and development because of wilderness classification and because semi-primitive recreation areas would be protected by non-surface occupancy stipulations on all new leases.

CONSULTATION WITH OTHERS

Planning Coordination

From the outset of the planning process, Federal, State, and local agencies and interested publics have been informed of the Forest Plan's development. Letters, planning updates, news releases, and public meetings were all used to distribute information. In addition, many groups have corresponded and had meetings with the Forest when necessary. These actions are documented in the Forest planning records. Over 145 Federal, State, local agencies, businesses, conservation organizations, and user groups participated in the planning effort.

How Public Comments Were Used

Within the broad framework of Forest planning, public input is one of five considerations in the decision-making process. Forest Service decisions are based on five factors: 1) the law, 2) technical information, 3) resource capability, 4) professional judgement, and 5) public input. Public input enters into the decision-making process when there is room for interpretation in any of the first four factors, especially with regard to which uses will be emphasized. Public input, for example, would not be a factor in citing a violator of Federal regulations, but it does influence decisions about whether Forest management could emphasize one use versus another.

DEIS and Proposed Forest Plan

The public review period for the DEIS and Proposed Forest Plan began on July 26, 1982. The original 95 day comment period was extended by 30 days to November 30, 1982. During this time 800 DEISs and 1,200 Proposed Forest Plans were distributed to Federal, State, and local agencies and interested publics. Copies were also made available for review at Forest Service offices and local libraries.

The Forest hosted 24 meetings with special interest groups and Federal, State, and local agencies. Seven meetings were held with Forest Service personnel. Over 260 people participated in 12 public workshops.

Over 1,100 individuals, organizations, businesses, or agencies responded with 436 letters, oral responses, and petitions on the DEIS and Proposed Forest Plan.

CONSULTATION WITH OTHERS

DEIS-SUPPLEMENT & REVISED PROPOSED FOREST PLAN	The public review period for the DEIS-Supplement and Revised Proposed Forest Plan began on November 9, 1984. The comment period ended March 15, 1985. During this time 600 DEIS-Supplements and Revised Proposed Forest Plans were distributed to Federal, State, and local agencies and interested publics. Copies were also made available for review at Forest Service offices and local libraries. The Forest hosted 31 meetings with local publics, special interest groups, and Federal, State, and local agencies. Five meetings were held with Forest Service personnel. Over 600 people attended these meetings. Over 577 individuals, organizations, businesses, or agencies responded with 531 letters, form letters, form post cards, oral responses, or petition letters, on the DEIS-Supplement and Revised Proposed Forest Plan.
FEIS	The FEIS summarizes public comments and Forest Service response to the comments. In addition, each commentator received an individual letter specific to his or her concern.

FEIS

Chapter I

Purpose and Need for the Proposed Action

Overview

This chapter describes the planning process used in the Lewis and Clark National Forest Plan. It also describes the geographic area and summarizes the public issues and Forest Service concerns addressed by the plan. The Forest Plan impacts, the public issues, and Forest Service concerns determined the scope of this Final Environmental Impact Statement. Major changes which were made from the DEIS and DEIS-Supplement, are identified.

PLANNING PROCESS

INTRODUCTION

This FEIS (Final Environmental Impact Statement) documents the analysis and discloses the significant environmental effects for a Proposed Action and other alternatives for the future management of land and resources of the Lewis and Clark National Forest. The Proposed Action is the basis for the Forest Land and Resource Management Plan (Forest Plan) which is described in a separate document. The purpose of this analysis and the Forest Plan is to provide a sustained yield of goods and services from the Forest, maximize long-term net public benefits, and address public issues and management concerns in an environmentally sound manner. Net Public Benefit is the overall value to the nation of all outputs and positive effects less all the associated Forest inputs and negative effects of producing priced and non-priced outputs from Forest lands (see Appendix B).

This FEIS and the Forest Plan are results of direction from RPA (Forest and Rangeland Renewable Resources Planning Act), NFMA (National Forest Management Act), and the NEPA (National Environmental Policy Act). Further direction was given by the implementing regulations of NFMA (36 CFR 219) and NEPA (40 CFR 1500-1508). Projects implementing the Forest Plan are subject to the NEPA process. However, environmental effects can be tiered from the broader environmental statements of the RPA Program, Regional Guide, and Forest Plan. Actions not covered by the hierachy of planning levels will require additional environmental analysis. The analysis and Forest Plan will guide the management of the Forest for the next 10 to 15 years unless conditions or demands significantly change. (36 CFR 219.10).

NATIONAL, REGIONAL AND FOREST PLANNING

The Forest Plan will supersede all previous land and resource management plans prepared by the Forest. It is a direct link to other planning - National and Regional. The national program, required by RPA, sets national direction and output levels for National Forest system lands. These output levels are based on suitability and capability information provided by Forest Service Regions. Each Region in its Regional Guide divides its share of the national production level among the Forests. The share for each Forest is based on detailed information furnished by the Forest. The Guide also delineates standards and guidelines for management within the Region. Thus the Forest Plan is the result of direction given by RPA, NFMA (including the implementing regulations), and the Regional Guide.

PLANNING PROCESS

Planning Process

The FEIS is the result of the first seven of ten planning actions required by NFMA (36 CFR 219). These seven planning actions are:

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

DEIS-Proposed Forest Plan

On July 26, 1982, as a result of the planning actions 1 through 7, the Lewis and Clark National Forest issued a DEIS and a Proposed Forest Plan. Because RARE II had apparently resolved the wilderness classification issue it was not included in the planning process.

However, in October 1982, the Ninth Circuit Court held that 47 areas in California had not been adequately analyzed for wilderness in the RARE II process. NFMA planning regulations were amended to include an evaluation of land suitable for wilderness classification.

DEIS Supplement-Revised Proposed Forest Plan

On November 9, 1984, a DEIS-Supplement was released. The Supplement evaluated the wilderness potential of roadless areas and public comments on the 1982 DEIS and Plan. New alternatives, which reflected the public comments and roadless area evaluation, were analyzed and a new preferred alternative was selected.

The Revised Proposed Forest Plan accompanied the DEIS-Supplement and explained the standards necessary to implement the new preferred alternative.

Remaining Process

The public and governmental agencies were asked to comment on the DEIS, DEIS-Supplement and Proposed Forest Plans. (see Chapter VII). After this review period planning actions 1 through 7 were repeated and this FEIS was prepared, filed with the Environmental Protection Agency, and made available to the public. The FEIS and Forest Plan will then be used by the Regional Forester as the information base for a Record of Decision to complete the planning steps:

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

PLANNING PROCESS

Planning Records

All of the Forest planning documents and planning files (planning records) are available at the Lewis and Clark National Forest Office, 1601 Second Avenue North, Great Falls, Montana. They contain the detailed information and decisions used in developing the Forest Plan, as required in NFMA regulations. The records are incorporated by reference in the FEIS and Forest Plan. Appendix D lists those planning records by title that are available on request.

Terms and Concepts

Many of the words and concepts in this FEIS require precise definitions. The Glossary contains commonly used terms.

MWSA Areas

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

In November, 1979, the Regional Forester decided to conduct a Regional study of three of the MWSA areas, with the remaining six to be analyzed in the respective Forest Plans. The two areas in the Lewis and Clark National Forest, the Middle Fork Judith and the Big Snowies, were analyzed in the Lewis and Clark Forest Plan process.

An analysis of the two Lewis and Clark National Forest study areas was completed, and a DEIS and report were transmitted to the Environmental Protection Agency and to the public, concurrently with the Lewis and Clark Proposed Forest Plan and DEIS, on July 26, 1982.

In the DEIS and report, as part of the Forest planning process, the Regional Forester recommended nonwilderness for both areas.

Public hearings were held in Great Falls and Lewistown, Montana. Hearing proceedings and written comments are contained in the "Middle Fork Judith and Big Snowies Wilderness Study Hearing Record." This publication is available for review at the Lewis and Clark National Forest Supervisor's Office in Great Falls and the Northern Region Office in Missoula.

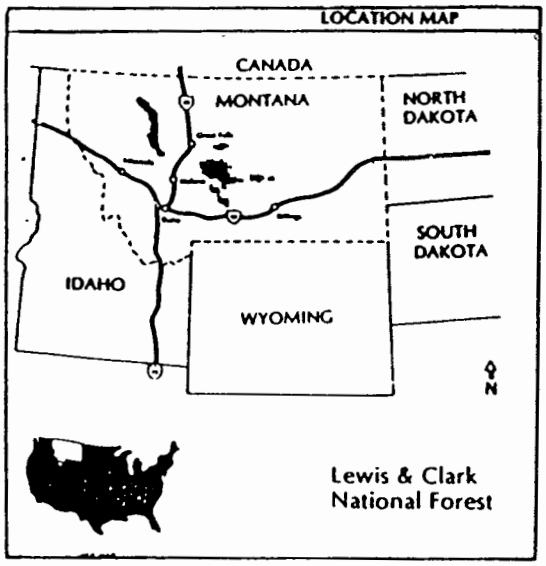
Final recommendations on the Middle Fork Judith and Big Snowies Wilderness Study Areas are being made through a separate FEIS. As in the draft, the FEIS recommends nonwilderness for both areas. The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek drainage which would be managed for timber production. These nonwilderness recommendations will receive further review and possible modification in the offices of the Chief of the Forest Service, the Secretary of Agriculture, and the President. Congress has reserved the right to make final decisions on wilderness designation.

The Regional Forester will not make a recommendation on the Deep Creek-Reservoir North Wilderness Study Area until the area's oil and gas potential has been determined.

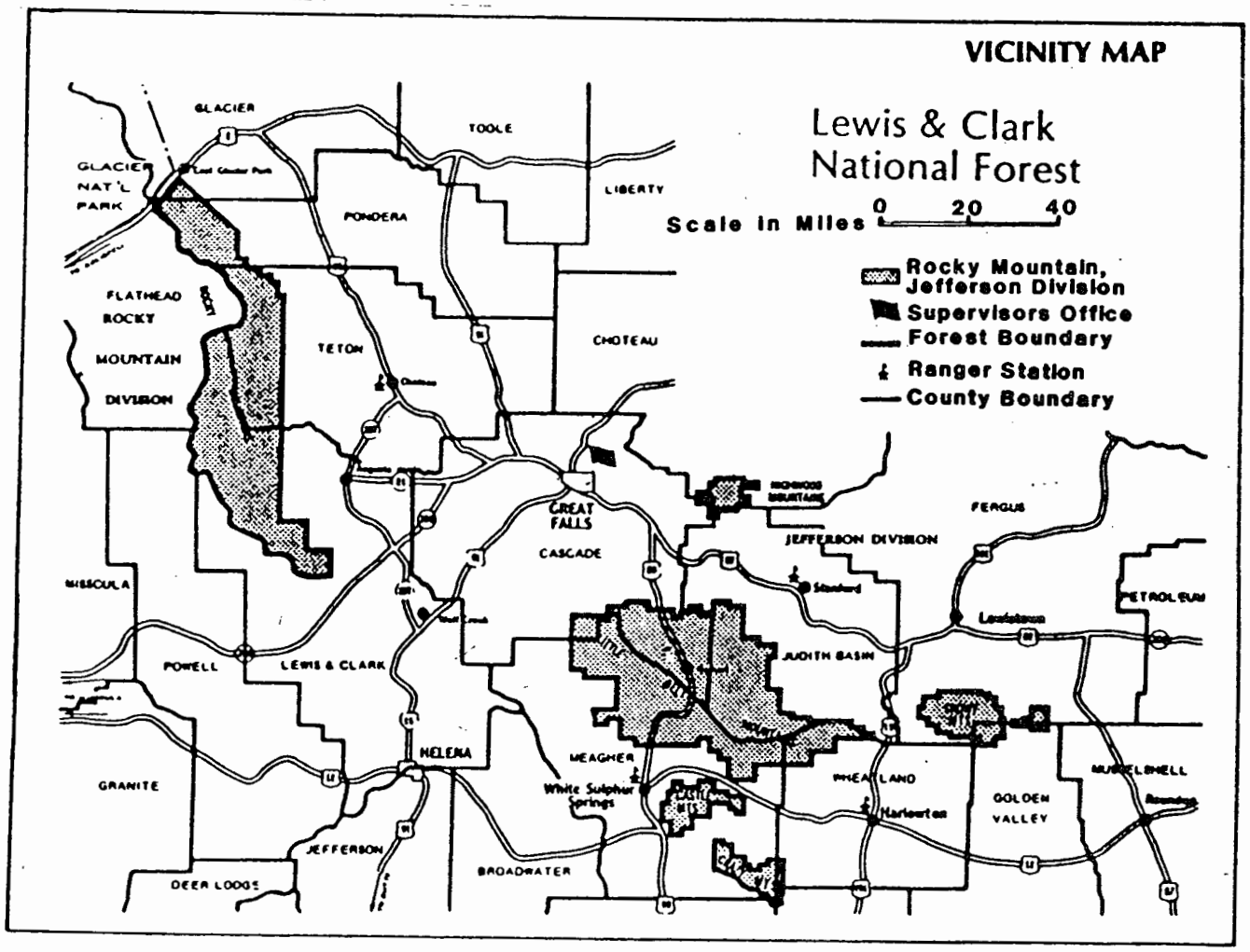
Until Congress determines otherwise, recommended wilderness additions and wilderness study areas will be managed, subject to existing private rights and uses, to maintain their existing wilderness character and potential for inclusion in the National Wilderness Preservation System. After Congress's decision, further analysis may be necessary to incorporate its decision into the Forest Plan.

GEOGRAPHIC AREA

GENERAL DESCRIPTION



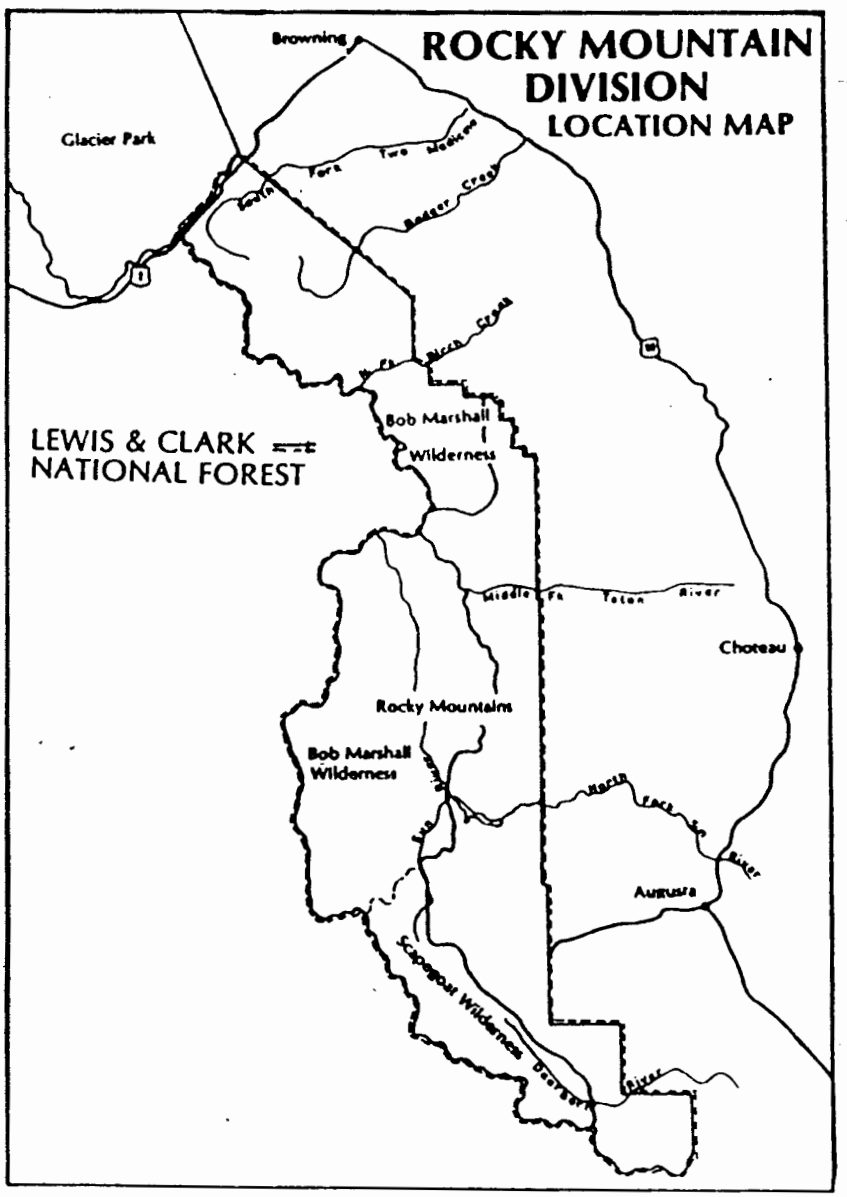
The Lewis and Clark National Forest is in north-central Montana within the upper Missouri River system. The Lewis and Clark National Forest encompasses 1,999,022 acres with the National Forest System boundary. Of this 1,843,397 acres are National Forest System land and the remainder are privately owned. Historically, the Forest has been referred to by two major divisions: the Rocky Mountain Division, containing the Rocky Mountain Ranger District, and the Jefferson Division, containing the Judith, Musselshell, and Kings Hill Ranger Districts. The Supervisor's Office is located in Great Falls.



GEOGRAPHIC AREA

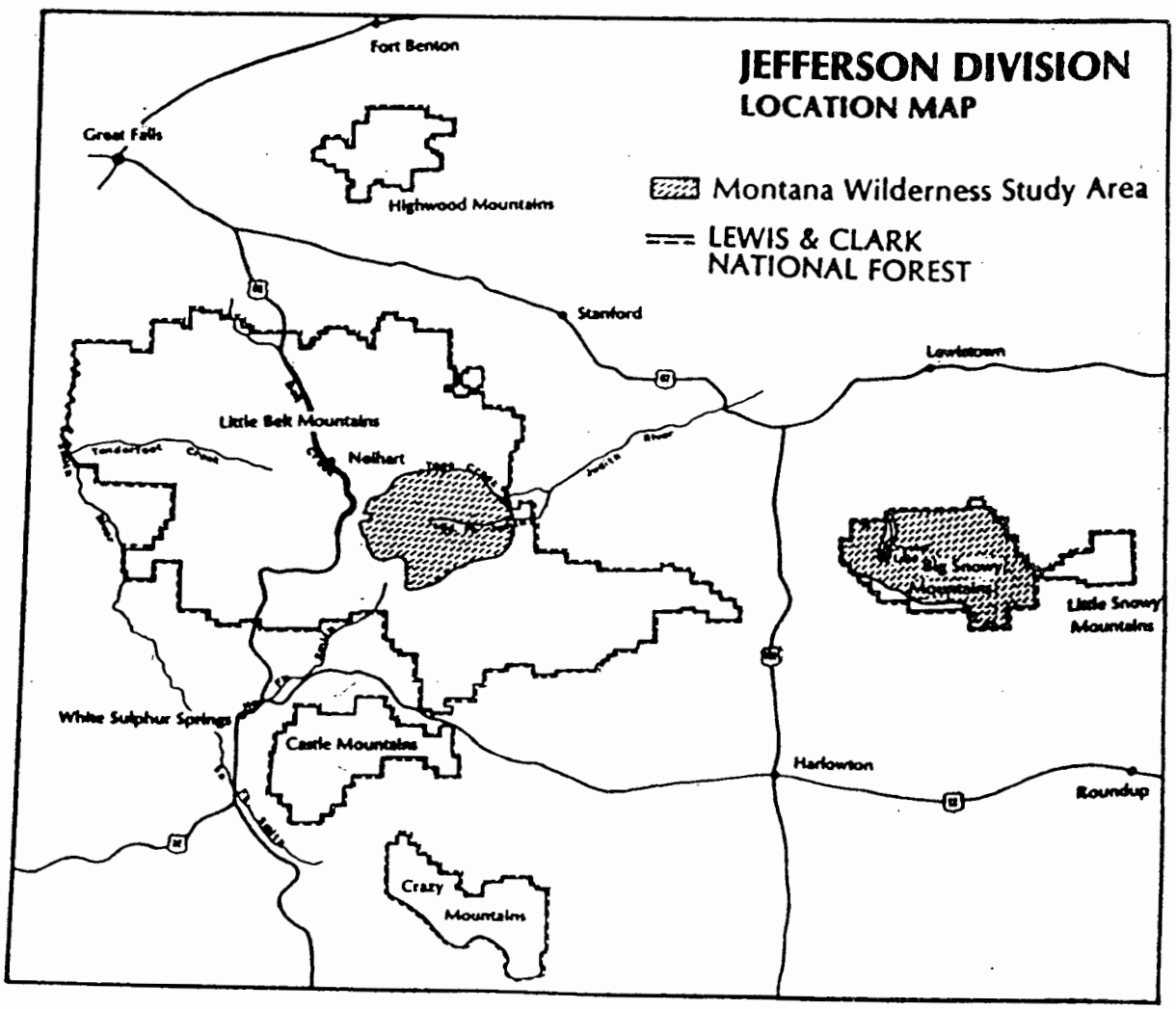
Rocky Mountain Division

The 776,259 acre Rocky Mountain Division, in Lewis and Clark, Teton, Pondera, and Glacier Counties, is bounded on the west by the Continental Divide and the Flathead National Forest, on the north by U.S. Highway 2 and Glacier National Park, on the south by the Helena National Forest, and on the east by the Blackfeet Indian Reservation, and Federal, State, and private lands. The Division contains 384,407 acres of the Bob Marshall and Scapegoat Wildernesses.



GEOGRAPHIC AREA

Jefferson Division	The 1,067,138 acre Jefferson Division lies east and south of Great Falls and is surrounded by private or other Federal and State lands. The Jefferson Division, in Cascade, Chouteau, Judith Basin, Fergus, Golden Valley, Wheatland, Sweetgrass, Park, and Meagher Counties, has six distinct mountain ranges. The Crazy Mountains lies southwest of Harlowton. The north half is administered by the Lewis and Clark National Forest and the south half by the Gallatin National Forest. The other mountain ranges in this Division are: the Little Belt Mountains, southeast of Great Falls; Castle Mountains, southeast of White Sulphur Springs; Big Snowy and Little Snowy Mountains, south of Lewistown; and Highwood Mountains; east of Great Falls.



ISSUES, CONCERNS, AND OPPORTUNITIES

SCOPING PROCESS

The first of the ten planning steps involves identification of issues, concerns and opportunities. This determines the changes and benefits that people want in goods, services, and uses, and environmental conditions for the Lewis and Clark National Forest. To aid in this step, letters were mailed in July 1979 to over 1,200 people who expressed interest in the Forest Plan preparation. Eleven public workshops were held around the Forest. Numerous organizations, corporations, elected officials, and other Forest users were consulted. Over 70 separate interviews were conducted. Comments were taken directly from the workshops and interviews. This list was screened using intensity, duration and scope criteria. This process yielded 32 issues or questions to be addressed by the Forest Plan. To this was added seven management concerns of the Forest Service. These planning questions, therefore, represent the major public issues and management concerns identified. A detailed discussion of the scoping process is in the planning record, "Identification of Public Issues and Management Concerns."

In 1983, a new wilderness issue was identified.

The issue was: Which roadless areas on the Lewis and Clark National Forest should be recommended for wilderness designation?

Additional public involvement was initiated in September 1983 to aid in the resolution of the wilderness designation issue. A proposed issue was sent to over 600 individuals, groups, businesses, and agencies who responded to the DEIS. Over 300 respondents commented on the wilderness issue. These comments were analyzed and considered in identifying the issue responding to wilderness designation.

ISSUES, CONCERNS, AND OPPORTUNITIES

ISSUES

Following is a list of the public issues and management concerns and a brief description of the public comments received on the DEIS and DEIS-Supplement. How they are resolved is discussed in Chapter II. Resource opportunities are also discussed in Chapter II (Benchmark Analysis). A complete summary of the public comments can be found in Chapter VI. A more complete discussion of the issue identification process is included in Appendix A.

Recreation

- What recreation activities and use levels should be permitted?

Some people questioned the priority recreation received in the DEIS, DEIS-Supplement, and Proposed Forest Plan. Some commentators felt that not enough consideration was given for retaining semi-primitive recreation settings. Others felt that recreation should not limit the Forest's development of other resources, especially regarding semi-primitive settings. Several reviewers identified specific areas they wanted managed for recreation values.

- How many campgrounds or camping sites should be provided?

A few commentators on the DEIS and DEIS-Supplement felt that the Forest Service should provide more campgrounds and other recreation facilities. Others felt that this was not needed.

- What facilities should be provided at developed campgrounds?

There was little comment on the type of facilities that should be provided at developed campgrounds. However, several reviewers wanted better campground maintenance.

- Should existing summer home permits be continued?

Two commentators wanted summer home permits to be terminated at the end of their tenure, one reviewer was against termination.

- What opportunities for both summer and winter off-road vehicle use should be provided?

Many commentators expressed a concern for maintaining ORV opportunities, especially snowmobiling opportunities.

- How much control (enforcement, closures, education) of off-road vehicles should be implemented?

Several people expressed a desire for more ORV restrictions, to protect recreation and wildlife and to reduce soil erosion. Others wanted less restrictions, to allow more motorized recreation and hunter access.

Cultural Resources

- How can the Forest carry out identification, protection, interpretation, and management of cultural resources?

Some people questioned whether the Forest Service had coordinated the Plan with the State, in accordance with the National Historic Preservation Act. Two reviewers were concerned that the cultural overview would not be completed in a timely manner.

- What is the best way to protect special management areas?

Special management area protection received little comment during the DEIS and DEIS-Supplement review.

Research Natural Areas

- How can the Forest identify candidate research natural areas containing specific grassland, shrub, and forest habitat types and aquatic ecosystems to meet Regional targets?

Four commentators supported Paine Gulch as a Research Natural Area. One reviewer recommended the Big Snowies be managed as a Research Natural Area.

Wilderness

- Should the Deep Creek-Reservoir North RARE II further planning area be recommended to Congress for inclusion in the National Wilderness Preservation System?

Many commentators supported wilderness classification for Deep Creek-Reservoir North. While others were against wilderness designation.

- Should the amount of wilderness use be controlled and how?

There were many contrasting views on oil and gas exploration in the wilderness. One reviewer supported restrictions on the use of pack animals and hunting in wilderness.

- Which roadless areas on the Lewis and Clark National Forest should be recommended for wilderness designation?

Almost half of the commentators on the DEIS and DEIS-Supplement had a concern with wilderness designation. Many reviewers supported wilderness classification for roadless lands on the Rocky Mountain Division, especially for the Renshaw, Silver King, and Deep Creek areas. A few commentators opposed wilderness classification. On the Jefferson Division, reviewers were almost evenly split on their recommendations for wilderness classification for the Big Snowies and Middle Fork Judith roadless areas. A few commentators favored wilderness designation for the Tenderfoot/Deep Creek area.

Wildlife and Fish

- How much fish and wildlife habitat should be improved and to what extent?

- Some reviewers supported increasing the wildlife habitat improvement program.

- How should conflicts be resolved between wildlife and management activities of: livestock grazing; timber; oil and gas exploration and development; minerals; recreation; wilderness?

Over a third of the DEIS and DEIS-Supplement reviewers expressed concern about fish, wildlife, and their habitat. Many commentators expressed a concern with the effect of management activities on wildlife, especially on the Rocky Mountain Division. Some commentators felt that the proposed management for wildlife was unnecessarily restrictive.

- How much oil and gas activity can be accepted and still meet the intent of the Endangered Species Act?

Some commentators opposed any increase in oil and gas activities which might effect T&E species or their habitat. Other commentators viewed any development as contrary to the protection of T&E species, especially the grizzly bear. Several reviewers felt the proposed management was too restrictive for other activities including oil and gas.

Range

- How much livestock grazing should be provided?

Many commentators on the DEIS and DEIS-Supplement expressed an opinion on the grazing level. Several reviewers recommended less grazing, several recommended continuation of current grazing level, and several recommended increased grazing.

- Can and should the range structural and non-structural improvement program be involved and how?

A few reviewers made specific comments on range improvements.

- What are the effects of the following on livestock grazing; clean water act; early hunting season; wilderness management; wildlife management; timber management; recreation management. How can the impacts be resolved?

Several commentators thought the DEIS did not properly address the impacts of increased grazing on T&E species, elk, other big-game species, fish habitat, soil, water, and timber harvesting.

- How and where should range be provided for elk as well as cattle?

Many reviewers of the DEIS and DEIS-Supplement expressed a concern with elk and elk habitat. Some reviewers specifically mentioned livestock grazing and its impact on elk, elk habitat, and hunting opportunity.

- How can control of noxious weeds be improved and to what extent?

Some reviewers commented on noxious weeds and the Forest program to control them. Most reviewers felt the Forest should increase its program.

Timber

- How much timber should be harvested?

Numerous reviewers commented about the amount of timber harvested. Comments varied from decreasing the proposed amount to increasing the proposed amount. Many reviewers were against timber harvest in particular areas with a few comments favoring timber harvest in certain areas. Many reviewers were against increasing the timber harvest level on the Rocky Mountain Division.

- How can timber sales be prepared to provide proper coordination with other resources?

Numerous reviewers were also concerned with the effects of timber harvest on other resource values, including recreation, wildlife, water quality, and soil erosion. Others felt that the beneficial effects of timber harvest were not displayed.

- Should sales, including timber salvage, be planned on uneconomical areas?

Many reviewers indicated the Forest Service should not subsidize timber sales. They were opposed to below cost timber sales and stated that a timber sale should not be made unless financially efficient.

- What degree of slash cleanup should be required after timber harvest?

There was little comment on slash cleanup.

- What clearcutting, if any should be allowed and how could clearcutting be coordinated with other uses?

Several reviewers commented about clearcutting. Some were against clearcutting altogether, while others wanted smaller clearcuts. Still others wanted clearcutting used only when it was the appropriate silvicultural system.

- How much and what kind of reforestation is appropriate?

The State of Montana felt that reforestation should be based on economic analysis and that some artificial regeneration may be warranted.

- Should permits be required for free-use firewood cutting and what control should be established?

A number of commentators were concerned about firewood cutting. Most wanted firewood cutting continued or enhanced. Some were concerned with the environmental effects.

Minerals

- How much mineral exploration and development should be allowed?

Several commentators favored more oil and gas development because more oil and gas reserves were needed. Many reviewers were against oil and gas development because of the potential harm to wildlife, wilderness, scenic, roadless, and recreation values.

- How should conflicts between exploration for and development of mineral resources and surface resource values be resolved?

Many commentators on the DEIS and DEIS-Supplement expressed a concern with the effects oil and gas activities will have on the environment. Some reviewers felt that it was improper to assume only damage would occur from oil and gas activities.

- How can the Forest help achieve the national need for energy self-sufficiency through conservation of renewable and nonrenewable energy resources?

Some comments dealt with the demand and need for oil and gas and other minerals.

Soil and Water

- What coordination is necessary between water and other resources to protect watershed values and water quality?

Many reviewers were concerned about erosion, sediment, watershed protection, water quality, and water quantity. They felt that commodity production was favored over these important values.

- What measures are necessary to prevent or reduce erosion from: road and trail maintenance, off-road vehicle use, timber sales, and oil and gas exploration and development?

Of greatest concern was the effects that timber harvest and grazing could have on water quality. And, that the Forest Plan must identify more specific measures to protect water quality values.

Human and Community Development

- How do the rights accorded to the Blackfeet Indian Tribe in the agreement modified by Congress in 1896 affect management of National Forest land covered in that agreement?

Some reviewers felt the Forest Plan did not adequately address the Blackfeet Treaty Rights.

Lands

- What landownership adjustment would support resource management goals and where should the Forest place its priorities in an adjustment program?

A few commentators favored land exchanges to improve Forest management. Some reviewers were concerned with specific land exchanges.

Facilities

- What is adequate access to and within the National Forest?

A few reviewers felt the lack of public access denied them recreational and other activities on the Forest. However, others felt increased access would hinder recreation quality and decrease wildlife habitat. Many reviewers were concerned about new road construction. Several comments were about specific locations. Many reviewers were concerned with the number of roads or the amount of access.

- Should additional trails be provided?

A few reviewers supported increasing trail construction/reconstruction, both snowmobilers and cross-country skiers wanted more marked and groomed trails.

- What roads should be maintained and to what extent?

There was little discussion on road maintenance.

Protection

- How much, if any, prescribed burning should be planned?

A few reviewers stated their approval of prescribed burning.

Cost Efficiency	- To what extent and in what manner should insect and disease control be carried out? Several commentators recommended a higher level of timber harvest on available land, to prevent losses to insects, disease, and fire. Other reviewers questioned or opposed the mountain pine beetle management. - Consider the need to provide goods and services efficiently. Many reviewers expressed concern with efficient Forest management including the timber sale program, range program, roads, and oil and gas activities.

CHANGES BETWEEN DRAFT TO THE FINAL EIS

In response to public comment, the following changes have been made between the draft to the final EIS.

Chapter I

- A summary of public comments on the issues and concerns has been added.

Chapter II

- A table showing Research Natural Area objectives has been added.
- The acres recommended for wilderness designation have been increased under the Preferred Alternative (G).
- Additional information on T&E species has been provided.
- The timber harvest schedule for the Preferred Alternative (G) has been changed.
- Information on timber utilization standards has been added.
- A table showing oil and gas potential by mineral potential class has been added.
- A table showing metallic and other minerals potential by mineral potential class has also been added.
- The miles of road for the Preferred Alternative (G) has been reduced slightly.
- The discussion on net public benefits and nonpriced benefits has been expanded.
- Cost and benefits are displayed by resource element.
- A discussion and display of noncash benefits has been added.
- Information on the indicators of responsiveness of alternative to major issues and concerns has been added.
- Qualitative and quantitative comparison of alternatives has been consolidated.

Chapter III

- Additional information on the affected environment has been added.

CHANGES BETWEEN DRAFT TO THE FINAL EIS

Chapter IV	- Additional information on the environmental consequences has been added. This information includes: Cultural Resource Management Wilderness T&E Species Wildlife and Fish Range Timber Minerals Soil and Water Facilities Insects and Disease
Appendix B	- The analysis process has been consolidated and expanded into Appendix B.

FEIS
Chapter II
Alternatives Considered

Overview

This chapter presents the development, description, analysis, and effects of alternative ways of managing land and resources.

Alternative Formulation -- describes the process to develop the alternatives.

Benchmarks -- identifies the minimum and maximum resource outputs; the benchmarks were used to develop and compare alternatives.

Alternative Description -- describes each of the alternatives considered in detail and those eliminated from detailed analysis.

The alternative proposed for further development as the Forest Plan is identified as the preferred Alternative G.

Alternative Comparison -- displays in a graphic and narrative form the alternatives' effects and outputs.

Much of the "process" type information has been removed from Chapter II. This information can now be found in Appendix B.

The "Need and Opportunity" section has been updated and changed to "Benchmark Analysis." Figure 2.1 which displays the range of alternatives has been added.

The Preferred Alternative (G) has been modified slightly. The area recommended for wilderness designation has been increased, the timber sale program schedule has been changed, and additional trail construction/reconstruction miles and wildlife habitat improvement are programed.

Alternative Summary has been eliminated. It still appears in the FEIS-Summary. Table 2.2, Summary of Total Resource Production by Alternative and Benchmark Level, has been expanded and placed at the end of the Chapter.

-over-

Additional information has been added to the alternative comparison of research natural areas and T&E Species.

Timber levels are now shown in detail for 15 decades.

Acres by Land Class is shown in graphic form.

Information on Long-Term Sustained Yield has been moved to Chapter IV.

Oil and gas and metallic and other minerals have been divided by mineral potential class.

The discussion on the economic alternative comparison has been reformated and expanded.

ALTERNATIVE FORMULATION

ALTERNATIVE FORMULATION	Alternative formulation, planning action 5, resulted from the four planning actions described below.
Planning Action 1- Identification of Issues, Concerns, and Opportunities	Public issues and management opportunities were identified through public involvement and coordination with other Federal agencies, State agencies, local governments, and the Blackfeet Indian Tribe. Forest Service management concerns were added. These issues and concerns are listed in Chapter I. Details on the process used to develop issues, concerns, and opportunities are available in the planning record, "Identification of Public Issues and Management Concerns" (see Appendix A).
Planning Action 2- Development of Planning Criteria	Planning process and management criteria were established. The interdisciplinary team developed criteria for the inventory data collection, the management situation analysis, and the alternative formulation. Process criteria are documented in the planning record, "Proposed Criteria and Documentation."
Planning Action 3- Inventory of Data and Information Collection	By using Forest resource inventories, a multi-resource data base was formed and stored in a computer retrieval system. Details of the data base content are in the planning record, "Data Base Components." Social and economic data for the counties directly affected by the Forest are in the planning record, "Social Impact Assessment Baseline, 1980."
Planning Action 4- Analysis of the Management Situation	The Analysis of the Management Situation identified: (1) feasible ranges of goods, services, and uses (i.e. benchmarks); (2) projected use levels; (3) potential to resolve issues and concerns; and (4) the feasibility of providing the levels of goods, services, and uses resulting from assigned RPA objectives. This analysis identified the opportunity to change management direction and is documented in the planning record, "Analysis of the Management Situation."
Planning Action 5- Formulation of Alternatives	Alternatives list different ways to address and respond to the major public issues, management concerns, and resource opportunities. Alternatives result from planning actions 1 through 4 and are documented in the planning record, "Alternatives."

ALTERNATIVE FORMULATION

ALTERNATIVE DEVELOPMENT PROCESS

Alternatives are developed that are responsive to issues, and contribute differentially to PNV (present net value), and NPB (net public benefit). A single, numeric NPB value is not calculated since monetary values associated with some resources such as timber (priced benefit) cannot be added to qualitative values such as a scenic view (non priced benefit). An understanding of the various types of values and interrelationships associated with Forest outputs aids decision makers in the selection of an alternative that most closely maximizes NPB. NPB includes both priced and non priced benefits. See the glossary for definition of PNV and NPB and Appendix B for further discussion.

The alternative development process used here is outlined in the Forest planning regulations (36 CFR 219.12). Parts of these planning regulations describe the role of NPB in the analysis.

Changes Between Draft and Final EIS

This section has been reorganized and process type information has been expanded and placed in Appendix

NFMA Requirements

NFMA requires that:

-- Each alternative will be capable of being achieved

-- A no-action alternative will be formulated.

-- Each alternative will provide for the orderly elimination of backlog work needed to restore renewable resources.

-- Each identified major public issue and management concern will be addressed in one or more alternati

-- Each alternative will represent, to the extent practicable, the most cost-efficient combination of management practices that can meet the objectives established in the alternative.

NFMA regulations further require that each alternative state:

-- Purpose of the alternative.

-- Conditions and uses resulting from the long-term application of the alternative.

-- The timing of the goods and services that will be produced with associated costs and benefits.

-- Resource management standards and guidelines.

BENCHMARKS

The primary analysis prior to developing alternatives was the Analysis of the Management Situation which is the determination of the ability of the Forest to supply goods and services in response to society's demands. This analysis provided a basis for formulating a reasonable range of alternatives by examining the following:

Benchmark Levels

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

The benchmark levels and analyses are summarized in this chapter. Table 2.1 on page 2-6 shows the average annual resource production by benchmark levels, Figure 2.1 on page 2-16 shows the relationship of benchmarks with alternatives, and Appendix B provides a detailed discussion of the benchmark levels.

Constraints

Regulation and policy constraints applied to benchmarks in most cases have the effect of reducing the maximum resource supply potential. NFMA regulation 219.27 specifies that certain minimum management requirements be included in the planning process. The methods to meet these minimum management requirements include developing standards and appropriate practices for management prescriptions; assignment of management prescriptions and intensities to analysis areas in FORPLAN; and applying specific constraints in FORPLAN. A complete description of the minimum management requirements can be found in Appendix B.

Benchmark Descriptions

Minimum Level - This benchmark defines the minimum costs of public landownership and the resource outputs which are incidental to custodial management. This benchmark is not a viable alternative bacause it is not responsive to public issues and management concerns. It also does not provide multiple resource uses and outputs. This benchmark is displayed in this EIS when comparison of alternatives are made in order to provide a reference to the minimum resource potential considered.

BENCHMARKS

Current Direction - This benchmark level defines the current level of goods and services and the most likely amount of goods and services expected to be provided in the future if current management direction continues. This benchmark is carried forward as the Current Plan Alternative.

Maximize Timber - This benchmark is designed to measure the maximum legal capability of the Forest to produce timber. This benchmark was not carried forward as an alternative. The benchmark information was used to help develop the high market Alternative A. High costs and a limited response to other resource issues and concerns supported dropping this benchmark from further consideration.

Maximize Range - Livestock forage production was maximized to determine the suitable range potential. This benchmark was not carried forward as an alternative. Information from the benchmark was used to help develop Alternative D. It was also eliminated from further consideration because of high costs and it does not adequately respond to other resource issues and concerns.

Maximize Recreation - Using market values and dispersed and developed recreation assigned values, this benchmark maximizes the Forests capacity to supply recreation. It defines the mix of recreation uses and combines it with a schedule of outputs that have an established market price or an assigned monetary value. Information from the benchmark was used in developing alternatives, but the benchmark was not carried forward because of the high costs of implementation.

Maximize Elk - The purpose of this benchmark is to maximize wildlife values with an emphasis on elk potential. The potential for elk is based on the availability of forage and cover on both summer and winter range and open road densities. Information from this benchmark was used to help develop Alternative C. The benchmark was eliminated from further consideration because it caused a severe reduction in livestock grazing which disrupted the stability of surrounding communities and incurred high costs for timber production.

Maximize Wilderness - Wilderness management was maximized through designating all roadless areas to wilderness. This benchmark level was used to help develop Alternative H.

BENCHMARKS

Maximize Present Net Value - Using market values for timber, range, mineral leases and developed recreation, this benchmark established the mix of resource uses combined with a schedule of outputs and costs that maximize present net value.

This benchmark was eliminated from further consideration because of the high cost of implementation, the difficulty that existing markets would have absorbing such high timber volumes, and potential for disruptive community stability. This benchmark is displayed in the EIS when a comparison of alternatives is made in order to provide a reference to the maximum present net value potential considered.

Changes Between Draft and Final EIS

Process type information has been expanded and placed in Appendix B.

BENCHMARKS

TABLE 2.1 AVERAGE ANNUAL TOTAL RESOURCE PRODUCTION BY BENCHMARK LEVELS

RESOURCE USE AND DEVELOPMENT FACTORS	UNITS	MIN LEVEL	CURRENT DIRECTION	MAX TIMBER	MAX RANGE	MAX RECREATION	MAX ELK	MAX WILDERNESS	MAX PNV
Recreation Opportunity by 2030	Thousand RVDs								
-Rural		194	194	194	194	194	194	194	194
-Roaded Natural		1905	2119	2435	2478	2521	1905	1905	2521
-Semi-Primitive		223	193	168	166	164	218	0	164
-Primitive		47	52	47	47	47	47	270	47
-Developed		0	198	198	198	230	198	230	198
Wilderness Opportunity	Thousand Acres	384	448	384	426	426	490	1387	384
Elk Population Potential	Animals								
-1982-1990		8500	8500	8500	8500	8500	8500	8500	8500
-1991-2000		8800	8500	8700	8300	8700	9500	8600	8700
-2001-2010		9200	8500	8900	8100	9000	10500	8700	9000
-2011-2020		9600	8500	8700	7800	8800	11500	8700	8800
-2021-2030		10000	8500	8500	7500	8600	12500	8600	8600
Range	Thousand AUMs								
-1982-1990		71.0	71.0	29.4	78.0	26.7	26.7	64.8	26.7
-1991-2000		0	71.0	31.0	85.0	27.2	27.2	64.9	27.2
-2001-2010		0	71.0	31.6	90.0	27.0	27.0	64.9	27.0
-2011-2020		0	71.0	33.0	90.0	29.2	29.2	64.9	29.2
-2021-2030		0	71.0	33.7	90.0	33.5	33.5	64.8	33.5
Timber									
-Lands, Suitable	Thousand Acres	0	196	676	654	640	207	266	640
-Timber Sale Program	Million Board Feet (Million Cubic Feet)								
-1982-1990		0	13.0(3.8)	24.0(7.1)	24.0(7.1)	24.0(7.1)	12.5(3.7)	19.8(5.8)	24.0(7.1)
-1991-2000		0	13.0(3.8)	31.2(9.2)	31.2(9.2)	31.2(9.2)	12.5(3.7)	25.5(7.5)	31.2(9.2)
-2001-2010		0	13.0(3.8)	40.5(11.9)	40.5(11.9)	40.5(11.9)	12.5(3.7)	33.1(9.7)	40.5(11.9)
-2011-2020		0	13.0(3.8)	52.7(15.5)	52.7(15.5)	52.7(15.5)	12.5(3.7)	43.1(12.7)	52.7(15.5)
-2021-2030		0	13.0(3.8)	69.5(20.4)	69.5(20.4)	69.5(20.4)	12.5(3.7)	49.5(14.6)	69.5(20.4)
-Long Term Sustained Yield Capacity	Million Board Feet (Million Cubic Feet)	0	14.3(4.2)	68.8(20.2)	56.3(16.6)	43.8(12.9)	18.1(5.3)	23.4(6.9)	43.8(12.9)
-Budget Required to Implement	Million Dollars								
-1982-1990		2.67	3.89	4.70	4.94	4.19	4.13	4.91	4.49
-1991-2000		2.60	3.69	5.14	5.40	5.83	3.93	4.69	5.00
-2001-2010		2.60	3.84	6.55	6.88	7.21	3.80	5.09	6.07
-2011-2020		2.60	4.03	7.26	7.62	8.34	4.03	6.20	7.11
-2021-2030		2.60	4.03	9.60	10.08	9.35	4.00	6.33	8.62
-Present Net Value 1/									
-at 4%		127.0	182.6	256.8	289.8	301.6	199.7	241.3	308.0
-at 7 1/8%		60.8	82.2	92.9	106.3	113.7	94.2	101.6	112.7

1/ Values given in 1978 Dollars

BENCHMARKS

BENCHMARK ANALYSIS	During the Analysis of the Management Situation, the benchmarks were analyzed in light of the identified issues and concerns and realistic resource potentials. The Forest identified a number of ways to increase cost efficiency and to balance cost efficiency with nonpriced components of net public benefits. Opportunities for change from current direction are summarized by resource.
Change Between Draft and Final EIS	This section has been given a new title (Need and Opportunity for Considering Change from Current Direction-DEIS) and updated.
Recreation	Developed recreation sites that include campgrounds (24), boating sites (2), and picnic sites (3), provide a capacity for about 198,500 recreation visitor days (RVD's) annually. Actual use of these developed recreation sites in 1984 was 66,000 RVD's. Current developed recreation sites are adequate to meet projected use on the Forest through year 2005. Dispersed recreation use in roaded settings include hunting, fishing, firewood cutting, berry picking, camping, picnicing at unimproved sites and driving for pleasure. Dispersed recreation on semi-primitive settings include hunting, fishing, hiking, backpacking, and camping. Primitive recreation in potential wilderness settings includes hiking, camping, horseback riding, backpacking, and fishing. The maximum capacity for dispersed recreation is 2,931,000 RVD's. Actual use in 1984 was 534,100 RVD's. Projected use in 2030 is 1,477,000 RVD's. There is capacity to supply anticipated use beyond 2030.
Wilderness	The Forest administers parts of two wildernesses, the Bob Marshall and Scapegoat, totaling 384,407 acres. The Montana Wilderness Study Act (Public Law 95-150) directs that 188,885 acres in the Big Snowy Mountains and the Middle Fork Judith be studied for possible inclusion into the wilderness system. Another 813,347 acres, in 24 separate roadless areas, are available for wilderness classification. Therefore, a maximum of 1,386,639 acres could be classified as wilderness. However, the Badger-Two Medicine Roadless Area is considered unavailable for wilderness classification, because of the Blackfeet Treaty

(See page 3-4.) This Agreement of 1896 placed a lien on the land which is incompatible with wilderness classification. This view was borne out by Congress in the passage of Public Law 94-557 requiring the Great Bear Wilderness Study.

The original bill, S.392, included 20,000 acres of Treaty rights area. However, the 20,000 acres were removed by Congress from the Great Bear Study Area before passage of the final law. The Treaty rights of the Blackfeet preclude wilderness classification of any of the Badger-Two Medicine Roadless Area.

The Deep Creek-Reservoir North area was selected for further planning under the RARE II Study. The RARE II Study concluded that even though this area rated very high in wilderness attributes, a rational decision could not be made until the oil and gas resources of the area were determined. The entire study area is leased for oil and gas. However, suit has been filed in U.S. District Court to review these leases. Because of the undetermined oil and gas potential and pending litigation, Deep Creek-Reservoir North is considered a further planning area. The area will be managed as a Wilderness Study Area. Once the oil and gas potential is determined, a recommendation regarding wilderness can be made through an amendment or revision to the Forest Plan.

Estimated 1984 wilderness use was 69,650 RVD's. Use is projected to reach 148,000 RVD's, in 2030. Use will increase in direct proportion to Montana's population growth.

The classified wilderness now provides 47,000 RVD's of primitive recreation, yearly. The current use is exceeding the primitive recreation capacity. This can be mitigated by increased funding which would allow more visitor contact and improve trail maintenance, which would help improve user distribution. With increased funding and management, the current wilderness opportunity could increase to 100,800 RVD's.

If all 1,386,639 acres were classified as wilderness, the Forest could provide 269,500 of RVD's of primitive recreation yearly.

Wildlife

Under existing habitat conditions the Forest currently can support an elk population of 8500 elk. Maximum capacity under ideal habitat

conditions, as predicted by the maximum wildlife benchmark level, is 12,500 elk. The Northern Regional Guide shows a goal of 5480 elk in 1990 and 6400 elk in 2000. The State of Montana has a primary goal to maintain current hunting opportunity and increase elk hunter recreation days.

Montana has a high demand for hunting, fishing, and most other outdoor sports. In 1982 there were 170,000 out-of-state hunting/fishing licenses sold. Nearly 3 out of 5 Montanans either hunt or fish. Elk hunters have increased from 70,300 in 1971 to 89,800 in 1980. About 13,500 elk are harvested in Montana yearly, over 70 percent of those harvested are on National Forest land. Other activities, such as wildlife photography, nature study, and bird watching, are increasing. All uses of wildlife resources are expected to rise.

Threatened and endangered species such as grizzly bears and gray wolves are known to inhabit the Forest. Bald eagles are observed during spring and fall migrations. Peregine Falcon is rarely observed. Forest management activities are guided by both formal and informal consultation with the U.S. Fish and Wildlife Service.

Range

Current domestic livestock grazing use is 71,000 AUMs (animal unit months). Under maximum production, livestock grazing could increase to 90,000 AUMs. The increase in forage production is attained by harvesting timber to create transitory range, prescribed burning to inhibit sagebrush and conifer invasion, and increasing the use of structural improvements. Demand for Forest grazing permits presently exceeds the grazing permits available. The demand for livestock grazing will be as great as the forage allocated to livestock use.

The Forest cannot significantly reduce current livestock use because the reduction could hinder the stability of local ranches. Therefore, 64,800 AUMs was considered the lowest possible grazing level.

Timber

The current timber sales program is 13.0 million board feet annually. (Average amount offered last 10 years). The maximum timber and minimum level benchmark indicate that the allowable sale quantity can range from a minimum of 0 to 24 MMBF per year the first decade. The four mills that process 75

to 90 percent of the Forest harvest have a one-shift yearly capacity of about 50 million board feet. The 1978 East Zone Timber Program Analysis concluded, that because the supply of private timber and the cost of harvesting private timber has risen steadily in relation to National Forest timber costs, the demand for Forest timber should increase within the next five to ten years.

Opportunity to increase timber harvest levels will depend on utilization of stagnated trees below saw timber size, increasing harvest in roadless areas, increased funding for road access and continued intensive silvicultural treatment. Lands suitable for timber management range from 0 in minimum level benchmark to a high of 675,690 acres in the maximum timber benchmark.

Oil and Gas

Based on previous environmental analyses, 413,516 acres of the Forest have been leased or recommendations have been made. Another 60,526 acres of lease applications are pending in the Silver King-Falls Creek and Renshaw roadless areas. In addition, 67,413 acres of leases are pending in the Big Snowies MWSA area.

The Bob Marshall-Scapegoat-Great Bear Wilderness complex was withdrawn from mineral entry on January 1, 1984.

Natural gas consumption in North America has grown from 9 percent of the total energy consumed in 1950, to 30 percent in 1975. In the United States, over 40 million households and 3 million businesses rely on natural gas for an energy source (USDA-1981, Oil and Gas Leasing on Nonwilderness Lands).

Exploration activity for natural gas on the Rocky Mountain Division is expected to continue for some time.

Metallics and Other Minerals

The Jefferson Division of the Forest has a long history of silver, zinc, lead, sapphire, and gold mining. Production has been mostly from small mines which produced intermittently up to the 1950's.

There is a moderate level of exploration activity. This includes geological mapping, sampling, and drilling. Development type work is taking place in the Barker-Hughsville area on patented claims; some

	development work is taking place on unpatented claims. At present the Forest receives 12-15 plans per year, mostly from small scale operations. Although the number of operating plans would increase in the future, production would not likely increase significantly during the next 50 years. Production would probably come from the Barker-Hughsville properties. The price and demand of most forest minerals is set by the world market.
Socioeconomic	The Maximum Present Net Value of the Forest is $308 million represented by the Maximum PNV Benchmark. The minimum average annual discounted cost in the first decade is $2.7 million, represented by the minimum level benchmark. The maximum PNV benchmark and minimum level benchmark are the standards that alternatives can be compared with for cost efficiency. Local Lewis and Clark Forest related private sector employment was 946 jobs in 1980. Private sector employment ranges from 946 jobs in the Minimum Level benchmark to 2196 in the Maximum Present Net Value benchmark (fifth decade). The majority of these jobs are related to the large increase in timber harvest levels under the Present Net Value Benchmark.

ALTERNATIVES	The alternatives to be considered in detail and those eliminated from detailed study were identified after completing the Analysis of the Management Situation. The preceding benchmark analysis prevented formulating alternatives that could not be implemented. A large number of alternatives could have been developed. Effort was concentrated in developing a reasonable range of alternatives that could be analyzed within the capability of the Forest and that were responsive to public issues and management concerns.
ALTERNATIVES ELIMINATED FROM DETAILED STUDY	The Forest developed and examined several alternatives that were eliminated from detailed analysis.
Changes Between Draft and Final EIS	The detailed information on other wilderness alternatives has been eliminated.
Public Workshop Alternatives	The Forest developed six preliminary alternatives using the responses from a series of public workshops (see planning record, "Alternatives from Public Involvement"). Two of the alternatives became Alternatives A and C. Three other public workshop alternatives centered on oil and gas leasing which the Forest had already made a decision on before completion of the Forest Plan. Because the three workshop alternatives could be represented by B and C without the oil and gas segments, they were considered as Alternatives B and C in detailed study. The sixth public workshop alternative was eliminated from detailed study. This alternative produced a high level of timber harvest with a moderate level of grazing and minerals. Dispersed recreation, developed recreation, wildlife habitat, and soil and water quality were maintained. Based on the Analysis of the Management Situation, maintaining wildlife habitat (particularly for big game) at the present level would not be possible with a high level of timber harvest and a moderate level of grazing. Therefore, this alternative was eliminated from detailed study.

Other Alternatives

Two other alternatives, RPA Low Bound and Mountain Pine Beetle, were eliminated from detailed study.

RPA Low Bound

The 1980 RPA Assessment directed the Forest to analyze a RPA Low Bound Alternative. The "Revised President's Statement of Policy" of December 1980 accepted only the high bound outputs as the RPA Recommended Program. Therefore, the low bound alternative was eliminated from detailed study.

Mountain Pine Beetle

NFMA regulations allow a forest to depart from non-declining yield if certain conditions are met. One of these conditions is high mortality losses from any cause that can be significantly reduced or prevented.

Significant lodgepole pine loss could result from a mountain pine beetle epidemic. This alternative tests the feasibility of preventing catastrophic losses by harvesting highly susceptible trees before they are infested. This alternative departs from non-declining yield.

This alternative would harvest timber over the first four decades at the same rate as the maximum timber benchmark. To harvest the timber, large tracts would have to be roaded (roading would be expensive and would disturb wildlife habitat and semi-primitive recreation). For these reasons, this alternative was not considered for further detailed analysis. (Also see Alternative F-Departure).

Non-Wilderness Alternative

A complete non-wilderness alternative was considered, but was eliminated from detailed study. The complete non-wilderness alternative would have maintained existing wilderness, but recommended 0 additional acres for wilderness classification. Alternative G recommends 51,834 acres for wilderness classification. In a non-wilderness alternative these 51,834 acres would be available for oil and gas leasing. All other resources would have been treated the same as in Alternative G and resource outputs and PNV would have been essentially the same for the two alternatives.

Since the 51,834 acres recommended for wilderness in Alternative G represent less than 5 percent of the total roadless area under consideration for wilderness; and since a complete non-wilderness alternative and Alternative G are nearly equal in all other respects, the non-wilderness alternative was dropped from detailed study.

ALTERNATIVES CONSIDERED IN DETAIL

The benchmarks presented in the previous section were used to develop sixteen alternatives that represent a range of resource outputs. For example, the Timber and Minimum Level Benchmarks show that the timber base sale levels can range from a minimum of zero to 24 MMBF per year in Decade 1. Alternatives were then designed to span the benchmark range while meeting policy constraints such as minimum visual quality and minimum acceptable harvest levels. The PNV Benchmark was used to determine the cost of meeting alternative objectives and provided a basis for changing alternative activities to optimize PNV while still meeting the objectives. The current direction benchmark was used to develop the current plan or No Action alternative.

The benchmark analysis also aided in addressing the broad range of public issues and management concerns. There are four major issues and concerns that are addressed: (1) timber production and its associated road building, (2) wilderness and roadless areas, (3) wildlife and fish production, including managing for the recovery of the grizzly bear, and (4) minerals and oil/gas exploration accessibility.

Changes Between Draft and Final EIS

A figure showing the range of alternatives has been added and Alternative G (Preferred) has been changed in response to public comments.

Multiple Use Management

Each alternative was formulated so that multiple resource uses occur and the minimum management requirements discussed in Appendix B are met. Each alternative harvests timber, provides forage for livestock and big game, manages wilderness, provides a mix of recreation opportunities, makes lands available for minerals, and provides wildfire protection. Each alternative provides sufficient habitat for the indicator species to meet or in most cases exceed the requirements for viable population levels. A list of indicator species and the rationale for their selection is in Chapter III. The minimum management requirements for assuring sufficient habitat is in Appendix B, part IV. The difference between alternatives is reflected in the amount and emphasis placed on the individual resources and how well each alternative responds to the issues and concerns.

Range of Alternatives

An adequate range of alternatives was developed by first formulating the alternatives that were required by regulation or policy. This included one that maximized timber production and most market opportunities (Alternative A), one alternative that reflected the current program (Alternative Current Plan), one that recommended wilderness classification for roadless lands (Alternative H), one that recommended no additional wilderness (Alternative G), and one that recommended wilderness classification for a substantial portion of the roadless areas while providing commodity production on the remainder of the Forest (Alternative H).

These alternatives were then examined to determine where they fit in the range of outputs expressed by the benchmarks, and how well they responded to the issues.

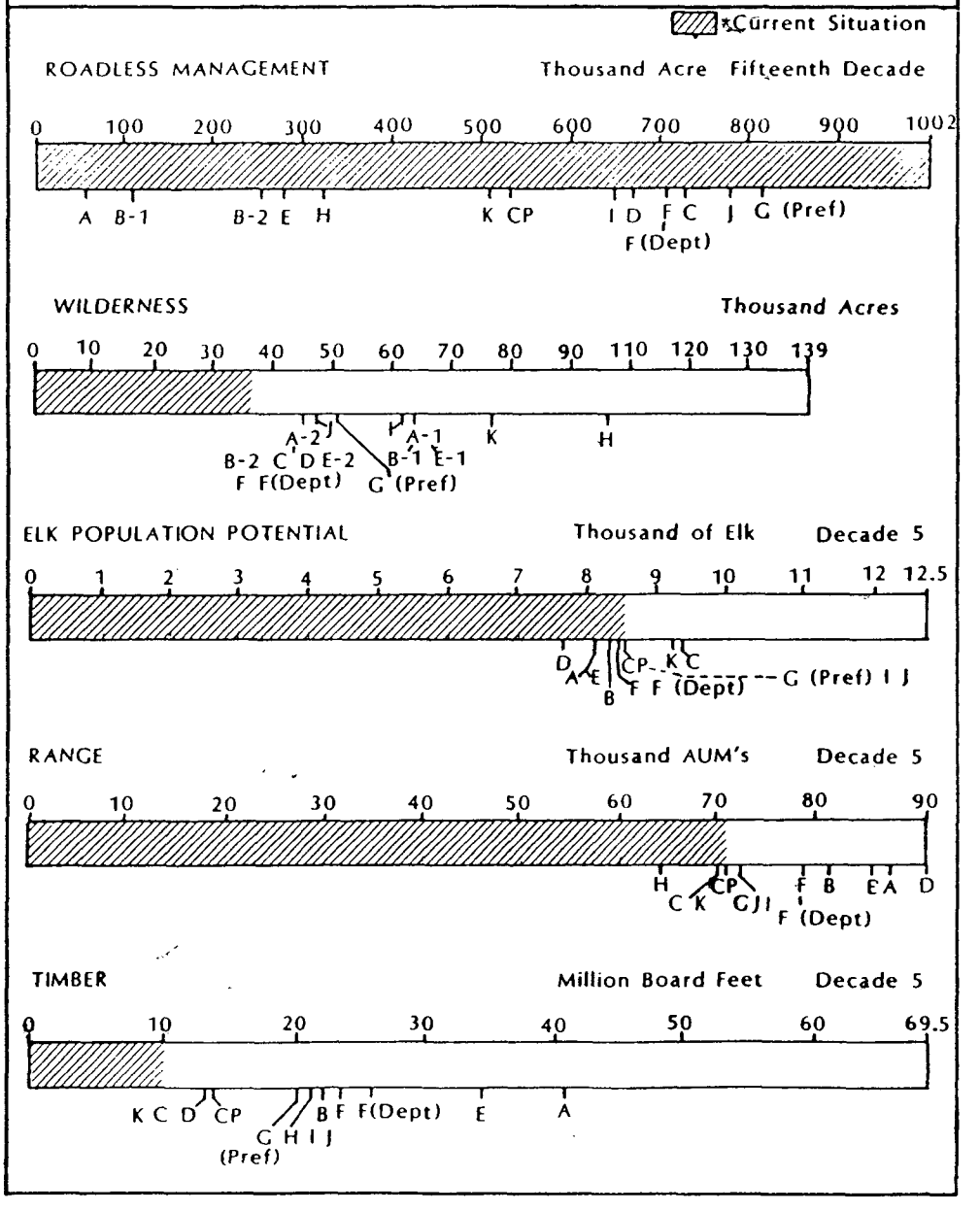
Additional alternatives were then developed that responded in different ways to the wilderness issues (Alternatives I, J, and K). Another alternative considered a departure from nondeclining timber harvest flow (Alternative F-Departure) while others considered the maximum production of big game (Alternatives C & I). These alternatives, including the one designed to meet RPA targets (Alternative A) and a proposed plan (Alternative G), helped to complete the range of alternatives. All of the alternatives considered are implementable options for management of the Lewis and Clark National Forest.

The 16 alternatives were tested against the benchmark capacities in order to determine if a sufficient range had been provided to respond to major issues. Figure 2.1 displays the range of alternatives.

ALTERNATIVE DESCRIPTION

The following decision space graphs show a minimum and maximum level for benchmarks and alternatives, including the Preferred Alternative-G. The shaded portion of each graph shows the current situation. Following this section the reader will find graphs, tables, and discussions comparing the major outputs and effects of each alternative.

FIGURE 2.1 RANGE OF ALTERNATIVES



*For alternative comparison purposes, Decade 5 projections are used as an index of possible future conditions.

Constraints Used To Develop Alternatives

All alternatives have a set of common constraints that are used in their FORPLAN analyses. While each alternative has a unique goal, there are a number of limitations that must be applied to achieve objectives or requirements that are common to all alternatives.

Mitigation measures were incorporated into all management prescriptions, as well as management standards, guidelines, and minimum management requirements that are common to all alternatives.

Common constraints applied in FORPLAN are discussed in detail in Appendix B, Section VII, and are briefly summarized below.

The common constraints used to meet alternative objectives are:

- A timber harvest, nondeclining flow constraint (except for Alternative F Departure).
- A timber ending inventory constraint.
- A minimum rotation age for timber.
- Existing wilderness acres (384,407) is maintained and not available for harvest or mineral development.
- Acres recommended for wilderness classification are not available for timber harvest. This amount varies by alternative.
- Meet minimum management requirements.
- All alternatives use only winter range prescriptions for critical elk winter ranges to ensure that forage and security needs for elk populations are met. This ensures that 35 percent of plant production is available for wildlife consumption on winter range.
- Livestock forage utilization on suitable rangeland ensures that at least 35 percent of the forage produced is reserved from consumption by livestock to maintain plant vigor.
- Deep Creek-Reservoir North roadless area acres (1-485) is maintained in a further planning status.

ALTERNATIVE DESCRIPTION

Current Direction (No Action Alternative)	Under current direction, the Forest would annually offer for sale 13 million board feet of timber. In addition, personal use firewood cutting would continue to annually remove about 10 million board feet of dead timber. Miles of road building would be directly related to timber harvest. The annual miles of arterial/collector road construction varies from about 1.5 to 5.0 in the planning horizon. Local road construction would be about 11 miles annually. Annual livestock grazing would remain at 71,000 AUMs annually. Wildlife habitat improvement would be done on about 460 acres yearly. Habitat potential for the current elk population (8,500 animals) would remain constant because of an aggresive road closure program that maintains security. Habitat for T&E species would be maintained or improved. About 65 acres of the total wildlife improvement program would be for T&E species habitat. Developed recreation opportunities would remain at 198,500 RVDs; no additional facilities would be built. The two Montana Wilderness Study Act areas would be managed to protect their wilderness character. Over 423,000 acres are leased for oil and gas exploration and development. All parts of the Forest, except existing wilderness, would be available for mineral entry. In the first decade, yearly average budget expenditure of $3,890,000 produces outputs and activities that provide $1,185,000 in receipts to the U.S. Treasury and 946 private sector jobs. The present net value for the entire 150 year planning horizon is $182,620,000.
Alternative A (RPA)	Alternative A would meet RPA objectives. This alternative would meet the direction in the "Revised President's Statement of Policy" which states, "at least one alternative in the EIS will be developed to determine how the 1980 Forest and Rangeland Renewable Resources Planning Act (RPA) Program could be best implemented on the Forest." The RPA Recommended Program emphasizes high levels of timber harvesting, livestock grazing, and increasing road access. By the fifth decade, 41 million board feet of timber would be offered for sale annually. Personal use firewood cutting would continue.

Grazing would increase from 71,000 AUMs to 86,400 AUMs as a result of more intensive management and incorporation of transitory range from timber harvest into allotments. Even though the wildlife habitat improvement program would triple to about 1138 acres annually, there would be a decrease in elk and catchable trout populations because of increased roading and grazing. Annual arterial and collector road construction would reach near 18 miles per year by the fifth decade and decrease to zero by the fourteenth decade, when all necessary roads would be in place. Local road construction would peak at 47 miles annually in the sixth decade and decrease to zero by the fourteenth decade. Habitat for T&E species would be maintained. About 150 acres of the total wildlife improvement program would be for T&E species habitat. Developed recreation would increase about 32,000 RVDs. Dispersed recreation opportunities in a roaded natural setting would increase significantly.

The Forest would recommend that all new oil and gas leases have standard stipulations to protect surface resource values. Special stipulations on existing leases would be reviewed and revised to be consistent with RPA goals. The increased access resulting from roading for the timber harvest would make mineral exploration easier.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification. Deep Creek-Reservoir North area would remain in a further planning status until the oil and gas potential has been explored under all the alternatives.

In the first decade, yearly average budget expenditure of $4,820,000 produce outputs and activities that provide $1,935,000 in receipts to the U.S. Treasury and 1132 private sector jobs. The present net value for the entire 150-year planning horizon is $256,800,000.

Alternatives A-1 and A-2

MWSA areas would be either recommended for wilderness classification (A-1) or managed with the rest of the Forest as described above (A-2).

Alternative B

Alternative B would increase the use of Forest resources while maintaining a variety of dispersed recreation opportunities.

Timber harvest and livestock grazing would increase. By the fifth decade, 23.7 million board feet of timber would be offered for sale annually.

Arterial/collector and local road construction would increase. Grazing would increase from 71,000 AUMs to 81,400 AUMs as a result of more intensive management. Wildlife habitat improvement would decrease slightly from the current 460 acres to about 440 acres per year. However, T&E habitat would be maintained. Of the total wildlife improvement program, 68 acres per year would be for T&E habitat. Elk population potential would drop slightly from the current 8,500 to 8,200 by the fifth decade. Increased timber harvest would increase dispersed recreation opportunities in roaded natural settings. Select areas in a semi-primitive recreation setting would be maintained. Developed recreation would remain at the current level, 198,500 RVDs. The Forest would continue to recommend no-surface occupancy, limited surface use, and timing restrictions on two-thirds of the acres in new and reissuance leases.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification.

In the first decade, yearly average budget expenditure of $4,160,000 produce outputs and activities that provide $1,386,000 in receipts to the U.S. Treasury and 969 private sector jobs. The present net value for the entire 150-year planning horizon is $235,200,000.

Alternatives B-1 and B-2

MWSA areas would be recommended for wilderness classification (B-1) or managed with the rest of the Forest as described above (B-2).

Alternative C

Alternative C would increase the Forest's wildlife program.

About 12.5 million board feet of timber would be offered for sale annually. This is slightly less than the current level. Timber harvesting would be precluded in most areas that are currently in a semi-primitive setting. Livestock grazing would decrease slightly to 70,000 AUMs, by the fifth decade. Elk and catchable trout habitat capacity would increase because the wildlife and fish improvement programs would nearly triple, yet the timber harvest and road construction programs would be slightly less than current levels. Of the 990 acres of annual wildlife habitat improvement, 155 acres

would be for T&E species habitat. By the fifth decade, an additional 15,000 RVDs of developed recreation would be provided. Most semi-primitive recreation opportunities would be maintained. Additional oil and gas leasing with surface occupancy would be recommended only on areas which are currently accessible and which are not extremely sensitive. To protect wildlife, timing restrictions would be recommended on most new oil and gas leases.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification.

MWSA areas would be managed for semi-primitive recreation and wildlife habitat, especially elk, through habitat improvement.

In the first decade, yearly average budget expenditure of $4,110,000 would produce outputs and activities that provide $1,185,000 in receipts to the U.S. Treasury and 947 private sector jobs. The present net value for the entire 150 year planning horizon is $180,300,000.

Alternative D

Alternative D would respond to the increasing national and local demand for livestock grazing and outdoor recreation.

To increase transitory range, 12.5 million board feet of timber would be offerd for sale, which is slightly less than the current level. Road construction would decrease slightly from the current direction because of the reduced harvest level. Livestock grazing would be increased to 89,900 AUMs by incorporating the transitory range into allotments and intensive range management. Dispersed recreation opportunities in roaded natural setting would increase. Many semiprimitive recreation opportunities would be maintained. There would be no timber harvest in these areas. Developed recreation opportunities would increase by 32,000 RVDs, by the fifth decade. The wildlife habitat improvement program would decrease slightly from the current direction of 466 acres per year to about 440 acres. This decrease combined with an accelerated range program results in a decline in elk habitat potential. Elk numbers are projected to decrease to 7,800 by the fifth decade.

Catchable fish potential is also projected to decrease because of increased grazing. Habitat for T&E species will be maintained or improved. The annual habitat improvement would increase from the current 66 acres to 71 acres. Nosurface occupancy or limited surface use would be recommended for some new oil and gas leases. Timing and activity coordination restrictions would continue to be used on two-thirds of the acres in new and reissuance leases.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification.

In the first decade, yearly average budget expenditures of $4,070,000 produce outputs and activities that provide $1,333,000 in receipts to the U.S. Treasury and 947 private sector jobs. The present net value for the entire 150 year planning horizon is $184,470,000.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for timber and for semi-primitive recreation.

Alternative E

Alternative E would harvest timber and graze livestock where most productive.

The Jefferson Division would have a high level of timber harvest and grazing. This would require more roads for access. By the fifth decade, about 34 million board feet of timber would be offered for sale annually. Grazing would increase from 71,000 to 84,700 AUMs. Dispersed recreation in a roaded natural setting would increase. Developed recreation in the Jefferson Division would increase by 4,000 RVDs, by the fifth decade. To protect surface resource values, the Forest would recommend standard stipulations on new oil and gas leases.

In the Rocky Mountain Division wildlife habitat management and semi-primitive recreation would be emphasized. All the T&E habitat is in this Division and would be maintained or improved. Timber would not be harvested on a regulated basis. There would be no road construction for surface resource management. The Forest would continue to recommend no-surface occupancy, limited surface use, the activity coordination stipulation, and timing restrictions on parts of all new oil and gas leases.

Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification.

In the first decade, yearly average budget expenditures of $4,230,000 would produce outputs and activities that provide $1,438,000 in receipts to the U.S. Treasury and 959 private sector jobs. The present net value for the entire 150 year planning horizon is $242,480,000.

Alternatives E-1 and E-2

MWSA areas would be either recommended for wilderness classification (E-1) or managed with the rest of the Forest as described above (E-2).

Alternative F

Alternative F would increase the use of Forest resources and would maintain dispersed recreation opportunities in a semi-primitive setting.

By the fifth decade, 24 million board feet of timber would be offered for sale annually, which is almost double the current program. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Road construction would increase. Livestock grazing would increase from 71,000 to 79,200 AUMs, by the fifth decade. Some of this increase would be from grazing on big-game winter range and in riparian zones.

To minimize impacts on wildlife and fish, the annual habitat improvement program would be increased from 466 acres to 678 acres, by the fifth decade. Also, projects affecting the wildlife habitat and fisheries would be coordinated with the Forest Wildlife Biologist. Elk population potential is expected to decrease by 100 animals and catchable fish potential is expected to drop by 12,000 fish. All T&E habitat would be maintained. Of the total wildlife improvement program, 85 acres would be for T&E habitat.

Developed recreation would increase about 32,000 RVDs, by the fifth decade. Most semi-primitive recreation settings would be retained. The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases.

	Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification. The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and timber production. Harrison and Cleveland Creek drainages, covering most of the westerner portion, would be managed for timber. In the first decade, yearly average budget expenditures of $4,620,000 would produce outputs and activities that provide $1,186,000 in receipts to the U.S. Treasury and 969 private sector jobs. The present net value for the entire 150 year planning horizon is $223,040,000.
Alternative F-Departure	NFMA regulations allow a Forest to depart from non-declining yield if certain conditions are met. One of these conditions is that high mortality from any cause can be significantly reduced or prevented. High mortality of lodgepole pine could result from epidemic infestations of mountain pine beetle. Alternative F's (Departure) timber harvest would increase to 28.1 million board feet after the fourth decade and then decline to the long-term sustained yield capacity of 26.6 million board feet, after the fifth decade. Livestock grazing would increase from 71,000 to 79,200 AUMs, by the fifth decade. Developed recreation would increase about 32,000 RVDs, by the fifth decade. Dispersed recreation opportunities in a roaded natural setting would increase. The effects on wildlife would be the same as in Alternative F. Implementation of a departure schedule would require immediate increases in funding for collector roads, new road rights-of-ways, and personnel. Renshaw and Silver King-Falls Creek areas would be recommended for wilderness classification. Deep Creek-Reservoir North area would remain in a further planning status. The MWSA areas will be allocated as in Alternative F.

In the first decade, yearly average budget expenditures of $4,940,000 would produce outputs and activities that provide $1,353,000 in receipts to the U.S. Treasury and 980 private sector jobs. The present net value for the entire 150 year planning horizon is $229,600,000.

Alternative G - Preferred Alternative *

Alternative G would increase the use of Forest resources, while providing diverse wildlife habitat and maintaining dispersed recreation opportunities in a semi-primitive setting.

By the fifth decade, 20 million board feet of timber would be offered for sale annually. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would provide wood products for local needs. Arterial and collector road construction would decrease from the current direction, but local road construction would almost double. Livestock grazing would increase from 71,000 AUMs to 73,600 AUMs, by the fifth decade. Adverse impacts on wildlife habitat would be minimized through coordination and mitigation. No additional grazing would be planned on big-game winter range or riparian zones, unless wildlife needs could be fully met. Annual wildlife habitat improvement would increase to 950 acres, of which 100 acres would be for T&E species. Developed recreation would increase about 32,000 RVDs, by the fifth decade. Most semi-primitive recreation settings would be retained. The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases.

Five areas (collectively called the East Slope) totalling 51,834 acres would be recommended as additions to the Bob Marshall and Scapegoat Wildernesses.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

*The Preferred Alternative has been modified slightly from the DEIS-Supplement. These changes are highlighted throughout the remainder of this Chapter.

In the first decade, yearly average budget expenditures of $4,350,000 would produce outputs and activities that provide $1,266,000 in receipts to the U.S. Treasury and 953 private sector jobs. The present net value for the entire 150 year planning horizon is $215,770,000.

Departure Schedule

Alternative F and G have almost the same acres available for timber harvest--Alternative F has 286,000 and Alternative G has 282,000 acres. Because the land base available for harvest in Alternative G is only 2 percent less than in Alternative F, the analysis of the preferred departure on Alternative F could be applied to Alternative G. The timber harvest level would increase to 28.1 million board feet after the fourth decade and then decline to the long term sustained yield capacity of Alternative G, 23.8 million board feet, after the fifth decade.

Alternative H

Alternative H would significantly increase the opportunity for wilderness classification, while increasing commodity outputs from those lands that are presently developed.

Almost all inventoried roadless areas, 664,326 acres would be recommended for wilderness classification. This would maximize the primitive recreation opportunity. There would be no timber harvested or motorized recreation in these areas. Valid mining claims and existing oil and gas leases would be managed under mineral laws and the Wilderness Act. Most oil and gas leases would not be reissued.

From other areas of the Forest, by the fifth decade 22.4 million board feet of timber would be offered for sale annually. Timber harvest would be programmed in areas that are presently developed on the Jefferson Division. Arterial and collector road construction would decrease, but local road construction would increase from the current direction. Livestock grazing would decrease from 71,000 to 64,800 AUMs. Wildlife habitat improvement would increase slightly to 496 acres annually. As as result of the habitat improvement and the acreage that would not be developed because of wilderness allocation, the elk population could increase by 300 animals. Developed recreation would increase about 32,000 RVDs, by the fifth decade.

Dispersed recreation opportunities in a roaded natural setting would remain constant. The Forest would continue to recommend no-surface occupancy, limited surface use, and timing restrictions on two-thirds of the acres in new and reissuance leases.

Deep Creek-Reservoir North would be designated as a further planning area.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,140,000 would produce outputs and activities that provide $1,467,000 in receipts to the U.S. Treasury and 1026 private sector jobs. The present net value for the entire 150 year planning horizon is $224,470,000.

Alternative I

Alternative I would increase the use of Forest resources, while providing diverse wildlife habitat and maintaining dispersed recreation opportunities in a primitive or semi-primitive setting.

About 235,704 acres of the land which has received high public interest, would be recommended for wilderness classification. These acres include most of the undeveloped lands on the Rocky Mountain Division and the Tenderfoot-Deep Creek area on the Jefferson Division. The wilderness allocation would increase the primitive recreation opportunity.

By the fifth decade, 22 million board feet of timber would be offered for sale annually. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small program of posts, poles, and firewood. Livestock grazing would increase from 71,000 AUMs to 73,600 AUMs, by the fifth decade. Wildlife habitat improvement would increase from the current direction to 703 acres annually. The elk population potential would be unchanged. Any adverse impacts on wildlife habitat from projects would be minimized through coordination and mitigation. No additional grazing would be planned on big-game winter range or

	riparian zones, unless wildlife needs could be fully met. T&E species habitat would be maintained or improved. Developed recreation would increase about 32,000 RVDs, by the fifth decade. The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases. Most of the Bear-Marshall-Scapegoat-Swan, Silver King-Falls Creek, and Renshaw areas on the Rocky Mountain Division and the Tenderfoot-Deep Creek area on the Jefferson Division would be recommended for wilderness classification. The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production. In the first decade, yearly average budget expenditures of $4,170,000 would produce outputs and activities that provide $1,229,000 in receipts to the U.S. Treasury and 966 private sector jobs. The present net value for the entire 150 year planning horizon is $219,370,000.
Alternative J	Alternative J would recommend areas on the Forest with outstanding wilderness quality and little resource conflict for wilderness classification. These areas include parts of the Silver King-Falls Creek, Renshaw, and Tenderfoot-Deep Creek Roadless Areas. Wilderness and primitive recreation would be increased. About 79,005 acres would be recommended for wilderness classification. In the areas recommended for wilderness, there would be no timber harvest or motorized recreation. Valid mining claims and existing oil and gas leases would be managed under mineral laws and the Wilderness Act. Oil and gas leases in areas recommended for wilderness classification would not be reissued.

Forest-wide by the fifth decade, 22 million board feet of timber would be offered for sale annually. Timber harvest activities would be programmed only in those areas where it is financially efficient considering costs and benefits. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small sales program for local needs. Arterial and collector road construction would decrease from current direction, however, local road construction would increase. Livestock grazing would increase from 71,000 AUMs to 73,600 AUMs, by the fifth decade. Adverse impacts on wildlife habitat would be minimized through coordination and mitigation. Wildlife habitat improvement would increase to 700 acres a year. The increased habitat improvement and coordination during project planning will maintain the current elk population potential. No additional grazing would be planned on big-game winter range or riparian zones, unless wildlife needs could be fully met. Developed recreation would increase about 32,000 RVDs, by the fifth decade.

The Forest would continue to recommend no-surface occupancy, limited surface use, activity coordination, and timing restrictions on two-thirds of the acres in new and reissuance leases.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,180,000 would produce outputs and activities that provide $1,238,000 in receipts to the U.S. Treasury and 1061 private sector jobs. The present net value for the entire 150 year planning horizon is $218,860,000.

Alternative K

Alternative K would increase the Forest wildlife program, while maintaining dispersed recreation opportunities in a primitive or semi-primitive setting.

Areas of high public interest, totalling 387,106 acres, would be recommended for wilderness classification. This would increase the primitive recreation opportunity. There would be no timber harvest or motorized recreation in these lands.

Valid mining claims and existing oil and gas leases would be managed under mineral laws and the Wilderness Act. Oil and gas leases in areas recommended for wilderness classification would not be reissued.

About 12.4 million board feet of timber would be offered for sale annually. This is slightly less than the current level. Timber harvesting would be precluded in areas that are currently in a semi-primitive setting. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would have a small program of post, poles, and firewood. Arterial and collector road construction would decrease from the current level, but local road construction would increase. Almost all of the road construction would be on the Jefferson Division. The capacity to winter big-game animals would be increased by tripling the wildlife habitat improvement program and by decreasing the livestock grazing to 69,900 AUMs, by the fifth decade. Also by the fifth decade, an additional 15,000 RVDs of developed recreation would be provided. Many semi-primitive recreation opportunities would be maintained. Additional oil and gas leasing with surface occupancy would be recommended only on areas which are currently accessible and which are not extremely sensitive to development. To protect wildlife, timing restrictions would be recommended on most new oil and gas leases. Existing leases would not be changed.

The Bear-Marshall-Scapegoat-Swan, Silver King-Falls Creek, and Renshaw areas on the Rocky Mountain Division and the Tenderfoot-Deep Creek, Pilgrim Creek, Crazy Mountain, and Big Baldy areas on the Jefferson Division would be recommended for wilderness classification.

The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except in the Harrison Creek Drainage. This drainage would be managed for timber production.

In the first decade, yearly average budget expenditures of $4,130,000 would produce outputs and activities that provide $1,186,000 in receipts to the U.S. Treasury and 960 private sector jobs. The present net value for the entire 150 year planning horizon is $200,140,000.

ALTERNATIVE COMPARISON

COMPARISON OF THE ALTERNATIVE'S RESOURCES

This section compares all the alternatives, the minimum level benchmarks, and the maximum present net value benchmark. It also addresses the pubic issues and management concerns (see Chapter I). The comparison is organized by resource.

Changes Between Draft and Final EIS

The Resource Output Summary has been expanded and now includes more detailed information on outputs during the planning horizon (150 years).

Alternative Emphasis and Output Summary

The management emphasis by alternative is shown in Table 2.2. A resource output summary for the alternatives and benchmarks is shown in Table 2.3 at the end of the chapter. The modeling and analitical procedures to evaluate the benchmarks and alternatives are discussed in Appendix B. Site specific wilderness evaluations are described in Appendix C.

> Further information on all alternatives is on file at the Forest Supervisor's Office. See FEIS Appendix D, Planning Records, for a listing of available information.

Planning Period

The Forest Plan will normally be revised at 10-year intervals but must be revised at least every 15 years. The Plan EIS projects outputs and effects to indicate the long-term implications of continuing with the Plan. The planning horizon used to estimate outputs and effects was 150 years. The displays in the EIS show data for only specified portions of the planning horizon, usually the first 50 years. While long range effects have been estimated, the Plan is only valid until it is revised, committing the Forest to a course of action no longer than 15 years.

Alternative Maps

Maps of the alternatives were in the "Lewis and Clark National Forest Plan--Maps" distributed with the DEIS and DEIS-Supplement. The maps showed areas, by alternative, where timber harvest and additional road construction activities could occur, areas of concentrated dispersed recreation, areas of special visual concern, and areas recommended for wilderness. The land allocation by mountain range was also shown.

TABLE 2.2 ACRES OF MANAGEMENT EMPHASIS BY ALTERNATIVE 1

The term management emphasis is used to indicate which resource activity is highlighted. If the emphasis is range, most of the activity in the area would be for range management. Resource activities which are compatible with the emphasis will continue, but with less intensity. The table below lists the acres of each management emphasis by alternative.

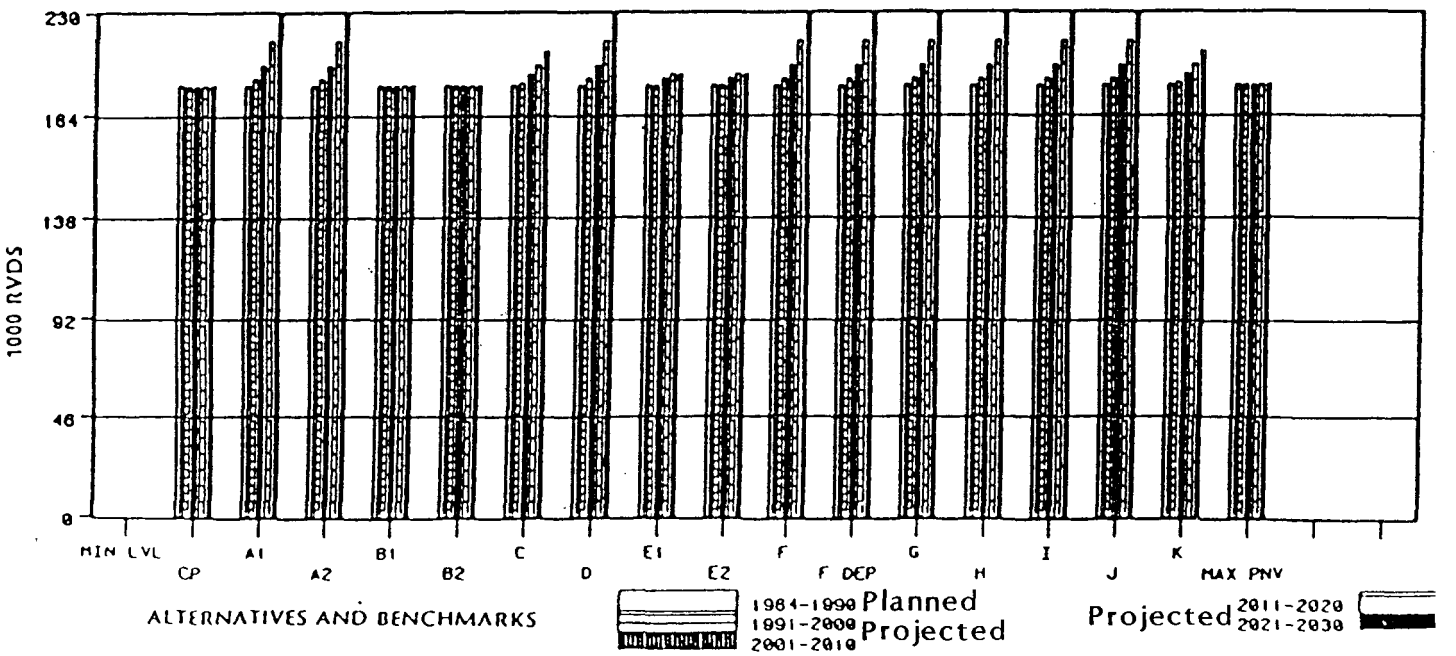
	MIN LEVEL	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2
Min. Level Mgmt	1458990	605225	382887	456703	431596	561672	695311	698693	434796	498188
Range Mgmt	0	294191	153427	181611	217514	258338	252480	297133	198350	221457
Timber Mgmt	0	179081	289260	347444	358862	400277	163034	180207	311129	417264
Timber/Range Mgmt	0	12364	132469	128347	56421	50241	40440	46663	55112	59545
Timber/Wildlife Visual Mgmt	0	4087	37386	63057	36890	15048	5725	10810	66331	55907
Timber/Range/Wildlife/Visual Mgmt	0	0	6513	2824	633	519	0	1443	1479	1497
Wildlife Mgmt	0	52193	117673	120588	43138	48955	154200	93800	67932	71457
Wildlife/ Range Mgmt	0	221	28111	35743	2308	2257	25083	8463	12238	11932
Wilderness Mgmt	384407	447711	637596	447711	637596	447711	447711	447711	637596	447711
Wilderness Study Mgmt	0	231723	41838	41838	41838	41838	41838	41838	41838	41838
Campground Mgmt	0	1733	1768	1768	1733	1733	1753	1768	1733	1738
Concentrated Recreation Mgmt	0	14193	6887	10029	13440	13440	11793	13055	11917	11904
Concentrated Recreation/Range Mgmt	0	675	2109	5634	1428	1428	3390	1813	2946	2959
Concentrated Recreation/Timber Mgmt	0	0	4099	0	0	0	0	0	0	0
Concentrated Recreation/Timber/ Range Mgmt	0	0	1374	0	0	0	0	0	0	0
TOTAL	1843397	1843397	1843397	1843397	1843397	1843397	1843397	1843397	1843397	1843397

TABLE 2.2 Continued

	ALT F	ALT F (Depart)	ALT G (Prefer)	ALT H	ALT I	ALT J	ALT K	MAX PNV
Min. Level Mgmt	850344	827384	760724	295104	585911	738820	475216	744604
Range Mgmt	131242	131730	191851	144164	207555	209144	210487	23532
Timber Mgmt	157676	183330	161062	149126	163783	167634	81265	462552
Timber/Range Mgmt	127020	123997	79083	88558	81947	82328	100811	85073
Timber/Wildlife Visual Mgmt	1346	645	34907	14446	32632	28618	15084	83287
Timber/Range/Wildlife/Visual Mgmt	0	0	3251	773	2139	2142	4711	0
Wildlife Mgmt	62028	60851	68961	16360	66914	69651	103184	310
Wildlife/ Range Mgmt	10136	9914	41830	24489	16860	14704	15624	101
Wilderness Mgmt	447711	447711	436241	1048733	620111	463412	771513	384407
Wilderness Study Mgmt	41838	41838	41838	41838	41838	41838	41838	41838
Campground Mgmt	1768	1734	1734	1734	1734	1734	1734	1734
Concentrated Recreation Mgmt	9092	8694	11252	9830	12730	12730	9586	14930
Concentrated Recreation/Range Mgmt	3296	4069	10653	6348	10643	10643	12344	1029
Concentrated Recreation/Timber Mgmt	0	0	0	1467	0	0	0	0
Concentrated Recreation/Timber/ Range Mgmt	0	1400	0	427	0	0	0	0
TOTAL	1843397	1843397	1843397	1843397	1843397	1843397	1843397	1843397

DEVELOPED RECREATION	The current (1985) developed recreation opportunity on public land is 198,500 RVDs, on 29 campgrounds, boating sites, and picnic sites which occupy 195 acres. Total current developed site use is 66,000 RVDs (1984). In addition, the private sector provided 44,500 RVDs in downhill skiing and 33,500 RVDs in resort and recreation resident use.
Changes Between Draft and Final EIS	The recreation settings under the Preferred Alternative (G) have been changed in response to public comment. Use figures have been updated.
Public Issues	- How many campgrounds or camping sites should be provided? - What facilities should be provided at developed campgrounds? - Should existing summer home permits be continued?
Comparison	Figure 2.2 displays the projected developed recreation opportunity for each of the alternatives, minimum level benchmark, and maximum PNV benchmark.

FIGURE 2.2 PROJECTED DEVELOPED RECREATION OPPORTUNITY



All Alternatives	The types of facilities at developed campgrounds would not change by alternative. Developed campgrounds provide picnic tables, grills, water, and outhouses for recreationists. Trash disposal is provided at some areas, but most have a pack-in pack-out policy. Most campgrounds have a per night fee. Under all alternatives, developed sites may be closed or eliminated if they would provide little or no opportunity, would conflict with other values, or would not be cost efficient. Forest-wide there are about 180 summer home permits. All permits would be handled the same under all alternatives. Summer home permits can be terminated if they are incompatible with public interest, or pose substantial physical conflicts with public needs. Also, termination action can be taken where permittees will not or cannot correct existing or anticipated unacceptable resource degradation, safety hazards, or unsanitary conditions.
Current Plan and Alternative B	Under the Current Plan and Alternative B, developed recreation opportunity would stay at the current level; no additional facilities would be built. The existing campgrounds and picnic areas would be maintained in the present condition.
Alternatives A, D, F, F-Departure, G-Preferred, H, I, and J	Under Alternatives A, D, F, F-Departure, G (Preferred), H, I, and J, developed recreation opportunity would increase from 198,500 RVDs, in 1985, to 230,100 RVDs, in 2030. This increase would be reached by expanding existing sites and developing seven new campgrounds sites on 36 acres. One site would be on the Rocky Mountain Division and six on the Jefferson. Development would not occur until needed. Expansion or new construction would not be expected before the second decade.
Alternatives C and K	Under Alternatives C and K, developed recreation opportunity would increase from 198,500 RVDs, in 1985, to 213,100 RVDs, in 2030. This increase would be from expanding existing campgrounds and developing three new recreation campgrounds on 18 acres. The new campgrounds would be on the Jefferson Division. Development would not occur until existing opportunity is fully used.

Alternative E	Under Alternative E, developed recreation opportunity would increase from 198,500 RVDs, in 1985, to 203,000 RVDs, in 2030. This increase would be from developing one campground in the Rocky Mountain Division. Development would not occur until needed.
DISPERSED RECREATION	Current (1985) available dispersed recreation opportunity is 2,369,000 RVDs. This includes 47,000 RVDs in a primitive setting (wilderness); 223,000 RVDs in a semi-primitive setting; 1,905,000 RVDs in a roaded natural setting; and 194,000 RVDs in a rural setting. Dispersed recreation opportunity is the capacity of an area to provide dispersed recreation, based on the area's recreation setting. Current dispersed recreation use is 534,100 RVDs (1984). Because a roaded natural setting provides the greatest number of RVDs per acre, the roading in all alternatives increases the total RVDs. Conversely, if the acres of primitive setting are increased in an alternative the total number of RVDs decreases. However, in all alternatives the amount of RVDs created by roading a semi-primitive area is always greater than the RVDs lost by recommending an area for wilderness. (In this document, only wilderness or recommended wilderness has a primitive recreation setting.)
Changes Between Draft and Final EIS	Use figures have been updated.
Public Issues	- What recreation activities and use levels should be permitted? - What opportunities for both summer and winter off-road vehicles should be provided? - How much control (enforcement, closures, education) of off-road vehicles should be implemented?
Comparison	Figures 2.3 and 2.4 display the projected dispersed recreation opportunity and the projected recreation setting, in 2030, for the alternatives, minimum level benchmark, and maximum PNV benchmark.

FIGURE 2.3 PROJECTED DISPERSED RECREATION OPPORTUNITY (2030)

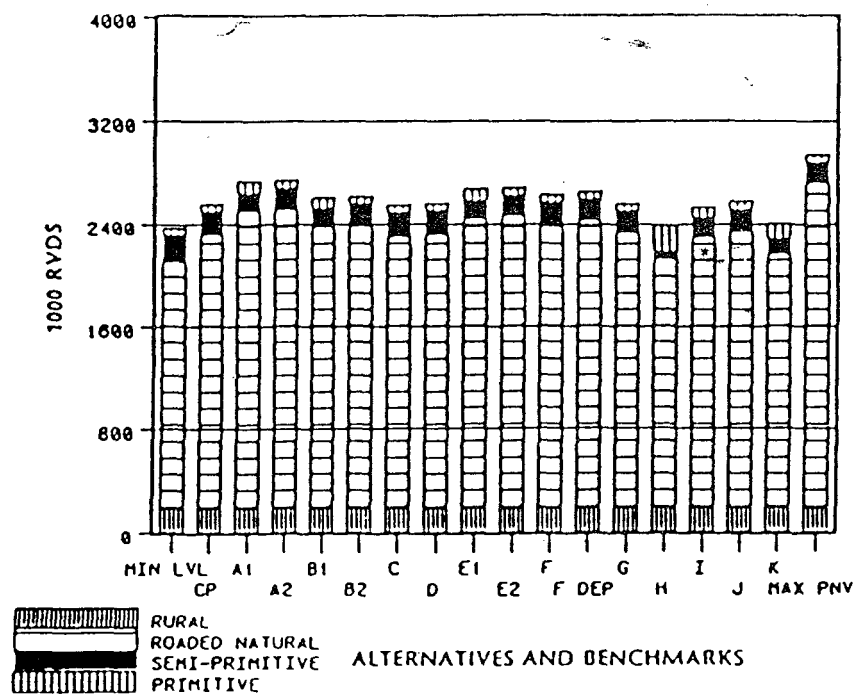
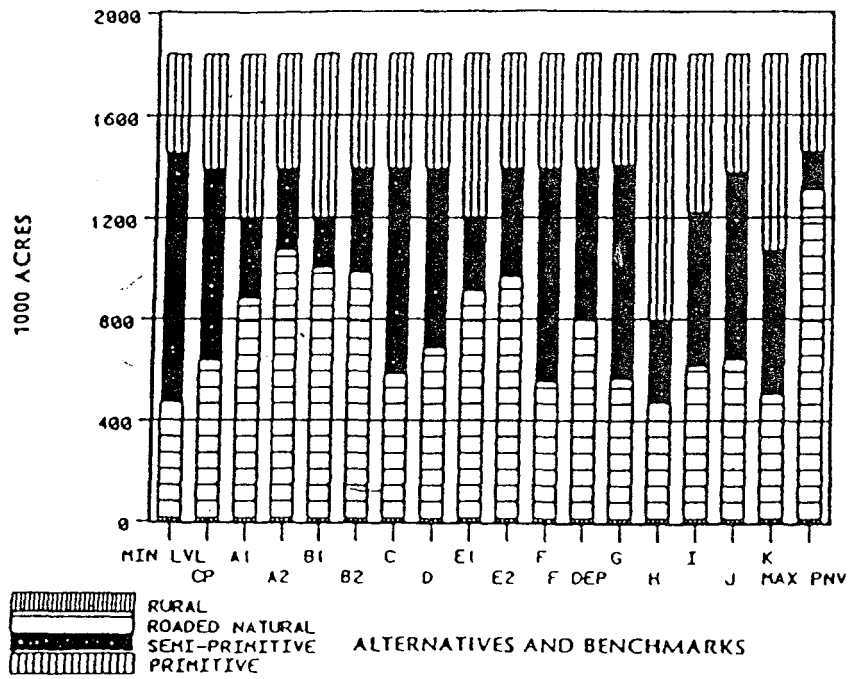


FIGURE 2.4 PROJECTED DISPERSED RECREATION SETTING (2030)



All Alternatives	All alternatives would increase dispersed recreation opportunities.
Current Plan	Under current management, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,558,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 230,000 acres. The primitive recreation setting would increase by 64,000 acres, and the roaded natural setting by 166,000 acres. The total RVDs would increase because of increased road access. Semi-primitive recreation would be reduced because most of the roadless areas would be roaded for timber harvest or mineral development. The roading would increase the roaded natural setting. Most of the arterial and collector roads would remain open year round. Primitive recreation setting would be increased from recommending Silver King-Falls Creek and Renshaw for wilderness.
Alternative A-1	Under Alternative A-1, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,734,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 745,000 acres. The primitive recreation setting would increase by 253,000 acres, and the roaded natural setting by 492,000 acres. Both of the MWSA areas and two areas on the Rocky Mountain Division would be recommended for wilderness, which increases the acres in a primitive setting. Road construction and reconstruction would more than double, to support the resource development on other parts of the Forest. This roading would decrease the acres in semi-primitive recreation and increase the acres in a rural recreation setting.
Alternative A-2	Under Alternative A-2, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,742,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 664,000 acres. The primitive recreation setting would increase by 64,000 acres, and the roaded natural setting by 660,000 acres. The total RVDs would increase because of increased road access. The primitive recreation setting would increase because of recommending Silver King-Falls Creek and Benchmark for wilderness. Semi-primitive recreation setting would decrease, while the roaded natural setting would increase because of roading.

The construction and reconstruction of all types of roads would more than double, to support the increased timber harvest and mineral development.

Alternative B-1

Under Alternative B-1, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,614,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 786,000 acres. The primitive recreation setting would increase by 253,000 acres, and the roaded natural setting by 533,000 acres.

The total RVDs would increase because of the wilderness recommendation and roading. The two MWSA areas and Silver King-Falls Creek and Benchmark would be recommended for wilderness which increases the acres in a primitive recreation setting. Developing much of the roadless area would reduce the semi-primitive and increase the roaded natural setting.

Alternative B-2

Under Alternative B-2, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,621,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 585,000 acres. The primitive recreation setting would increase by 64,000 acres, and the roaded natural setting by 521,000 acres.

The total RVDs would increase because of increased roading. The change in recreation setting is similar to that in Alternative A-2. However, the timber harvest is nearly half that in A-2, so the acres of roaded natural setting does not increase as much.

Alternative C

Under Alternative C, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,551,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 178,000 acres. The primitive recreation setting would increase by 64,000 acres, and the roaded natural setting by 114,000 acres.

The total RVDs would increase because of increased roading. The primitive recreation setting would increase by 64,000 acres, because Silver King-Falls Creek and Renshaw would be recommended for wilderness. Timber harvest would be slightly below current levels, but still 114,000 acres of a semi-primitive setting would be roaded, changing these acres to a roaded natural setting.

Alternative D	Under Alternative D, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,567,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 282,000 acres. The primitive recreation setting would increase by 64,000 acres, and the roaded natural setting by 218,000 acres. The total RVDs would increase because of roading. The wilderness recommendation, and therefore the increase in primitive setting, would be the same as A-1 and B-1. The roaded natural setting would increase to support the high timber outputs on the Jefferson Division.
Alternative E-1	Under Alternative E-1, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,686,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 693,000 acres. The primitive recreation setting would increase by 253,000 acres, and the roaded natural setting by 440,000 acres. The total RVDs would increase because of roading. The wilderness recommendation, and therefore the increase in primitive setting, would be the same as A-1 and B-1. The roaded natural setting would increase to support the high timber outputs on the Jefferson Division.
Alternative E-2	Under Alternative E-2, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,686,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 562,000 acres. The primitive recreation setting would increase by 64,000 acres, and the roaded natural setting by 498,000 acres. RVD increase is the same as in Alternative E-2.
Alternative F	Under Alternative F, the available dispersed recreation opportunity would increase from 2,348,136 RVDs, in 1985, to 2,633,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 147,000 acres. The primitive recreation setting would increase by 64,000 acres, and the roaded natural setting by 83,000 acres. Total RVDs would increase about 100,000 from the current plan. The semi-primitive recreation setting would only be reduced by about half that of the current plan. Silver King-Falls Creek and Benchmark would be recommended for wilderness,

which increases the primitive recreation acres the same as in current direction. The roaded natural setting would increase the least of any alternative.

Alternative F - Departure

Under Alternative F (Departure), the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,657,000 RVDs, in 2030. The semi-primitive recreation setting would be reduced by 392,000 acres. The primitive recreation setting would increase by 64,000 acres, and the roaded natural setting by 328,000 acres.

Total RVDs would increase because of the roads associated with the accelerated timber harvest. Primitive recreation would increase as in current direction. The semi-primitive setting would be reduced, mostly because of roading.

Alternative G - Preferred

Under Alternative G, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,565,000* RVDs, in 2030. The primitive recreation setting would increase by 52,000** acres, and the roaded natural setting by 73,000*** acres. The semi-primitive setting would be reduced by 125,000**** acres.
* 2,562,000 RVDs in DEIS-Supplement.
** 47,000 acres in DEIS-Supplement.
*** 96,000 acres in DEIS-Supplement.
**** 143,000 acres in DEIS-Supplement.

Total RVDs would increase because of roading, mostly on the Jefferson Division. The primitive recreation setting would increase by recommending 52,000* acres along the Rocky Mountain Front for wilderness. Alternative G has the smallest wilderness recommendation. The roaded natural setting would increase to reflect the timber harvest.
*47,000 acres in DEIS-Supplement.

Alternative H

Under Alternative H, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,390,000 RVDs, in 2030. The primitive recreation setting would increase by 664,000 acres and the roaded natural setting by 8,000 acres. The semi-primitive setting would be reduced by 672,000 acres.

Total RVDs would increase only slightly from the current direction. This would reflect the huge increase in primitive recreation setting and the small increase in roaded natural setting. The primitive recreation setting would increase because

all roadless areas, except the Badger-Two Medicine and Deep Creek-Reservoir North, are recommended for wilderness. Although timber harvest would increase from current direction, the area roaded will be low and areas under timber management would be intensively managed.

Alternative I

Under Alternative I, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,537,000 RVDs, in 2030. The primitive recreation setting would increase by 235,000 acres and the roaded natural setting by 144,000 acres. The semi-primitive setting would be reduced by 379,000 acres.

Total RVDs would increase, mostly because of roading on the Jefferson Division. Acres in a primitive recreation setting would increase, because of recommending most roadless areas on the Rocky Mountai Division and Tenderfoot-Deep Creek on the Jefferson Division for wilderness. Most of the increase in the roaded natural setting would reflect roads needed on the Jefferson Division for timber harvest.

Alternative J

Under Alternative J, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,583,000 RVDs, in 2030. The primitive recreation setting would increase by 79,000 acres and the roaded natural setting by 172,000 acres. The semi-primitive setting would be reduced by 251,000 acres.

Total RVDs would increase because of roading for timber and minerals access. The primitive recreation setting would increase because of recommending three areas on the Rocky Mountain Division for wilderness. The roaded natural setting would increase because part of the timber harvest would be from roading areas that are currently roadless.

Alternative K

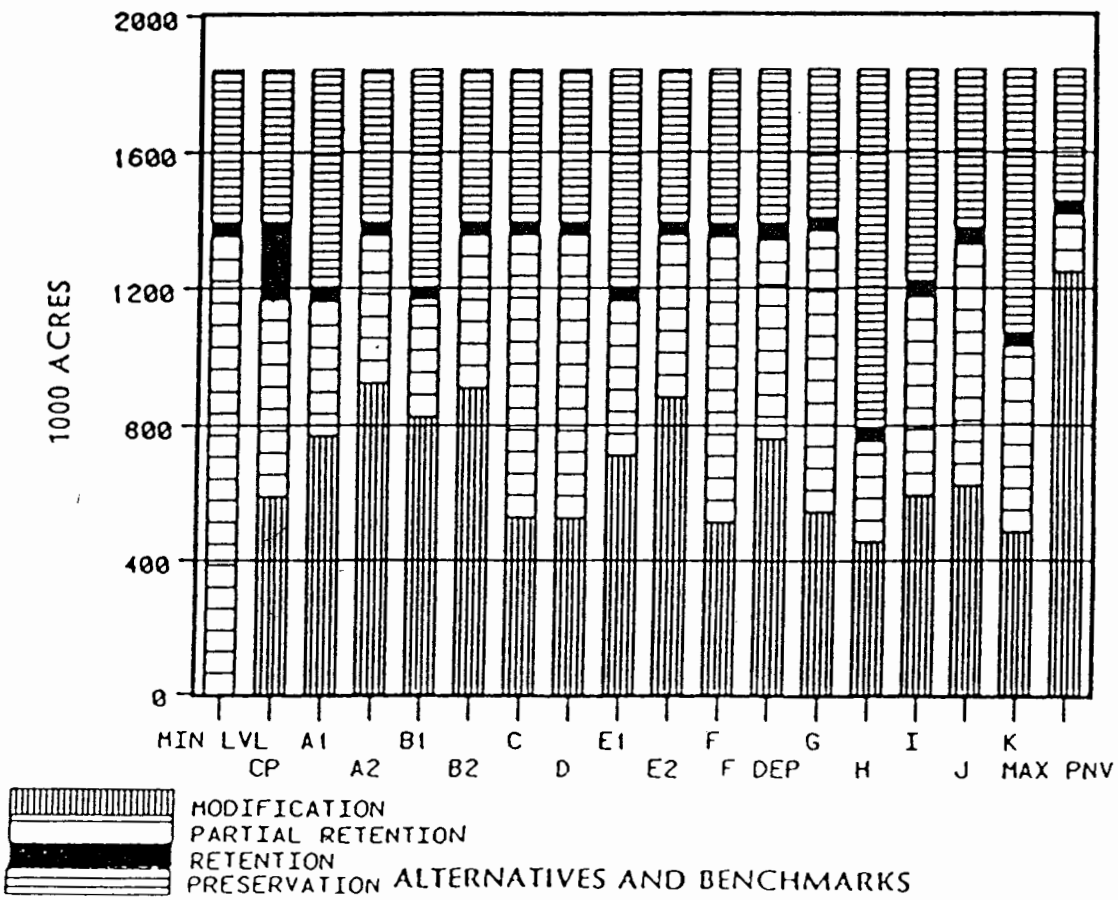
Under Alternative K, the available dispersed recreation opportunity would increase from 2,369,000 RVDs, in 1985, to 2,416,000 RVDs, in 2030. The primitive recreation setting would increase by 387,000 acres and the roaded natural setting by 35,000 acres. The semi-primitive setting would be reduced by 422,000 acres.

Total RVDs would increase slightly because of some roading in currently roadless areas for timber harvest. The acres of primitive recreation setting would be almost six times that in the current direction, because most roadless areas on the Rocky Mountain Division and 44,000 acres on the Jefferson Division would be recommended for wilderness.

CULTURAL RESOURCES	Cultural resources are managed under the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the Archaeological and Historical Conservation Act of 1974, and the Archaeological Resource Protection Act of 1979. Generally, the risk of damaging cultural resources increases with development and access.
Changes Between Draft and Final EIS	None.
Management Concerns	- How can the Forest carry out identification, protection, interpretation, and management of cultural resources? - What is the best way to protect special management areas?
Current Plan	The focus has been on (1) a project-by-project inventory, which is done prior to design and implementation of activities, and (2) identification of possible sacred sites in cooperation with the Blackfeet Indian Tribe.
All Alternatives	The cultural resources program will identify, protect, interpret, and manage cultural resources. Coordination with the Blackfeet Indian Tribe will continue. Special interest areas including caves, archaeological sites, and areas containing rare or unusual vegetation will also receive special protection under all alternatives.
Alternative A	This alternative would have the greatest risk to the Forest's cultural resources, because road construction and timber harvest is at the highest level. Inventory and site evaluation, along with implementing appropriate mitigating measures, would continue.
Alternatives B, F, F-Departure, G-Preferred, I and J	These alternatives would have moderate development. Project inventory, evaluation, and mitigation would continue.
Alternatives C, D, H, and K	These alternatives would have low development. The potential risk to cultural resources would be slight.
Alternative E	The Jefferson Division, which would be under intensive timber management, would incur risk as in Alternative A. In the Rocky Mountain Division, the risk would be low due to less development activity.

VISUAL RESOURCES	The visual resource is managed under the system described in National Forest Landscape Management, Volume 2, Chapter 1, The Visual Management System (Agricultural Handbook No. 462). This system identifies VQOs (visual quality objectives) based on the acceptable alteration of the landscape. The degree of alteration is classified by preservation, retention, partial retention, and modification.
Changes Between Draft and Final EIS	None.
Comparison	Figure 2.5 displays the projected VQOs, in 2030, for the alternatives, minimum level benchmark, and maximum PNV benchmark.

FIGURE 2.5 VISUAL QUALITY OBJECTIVES (2030)



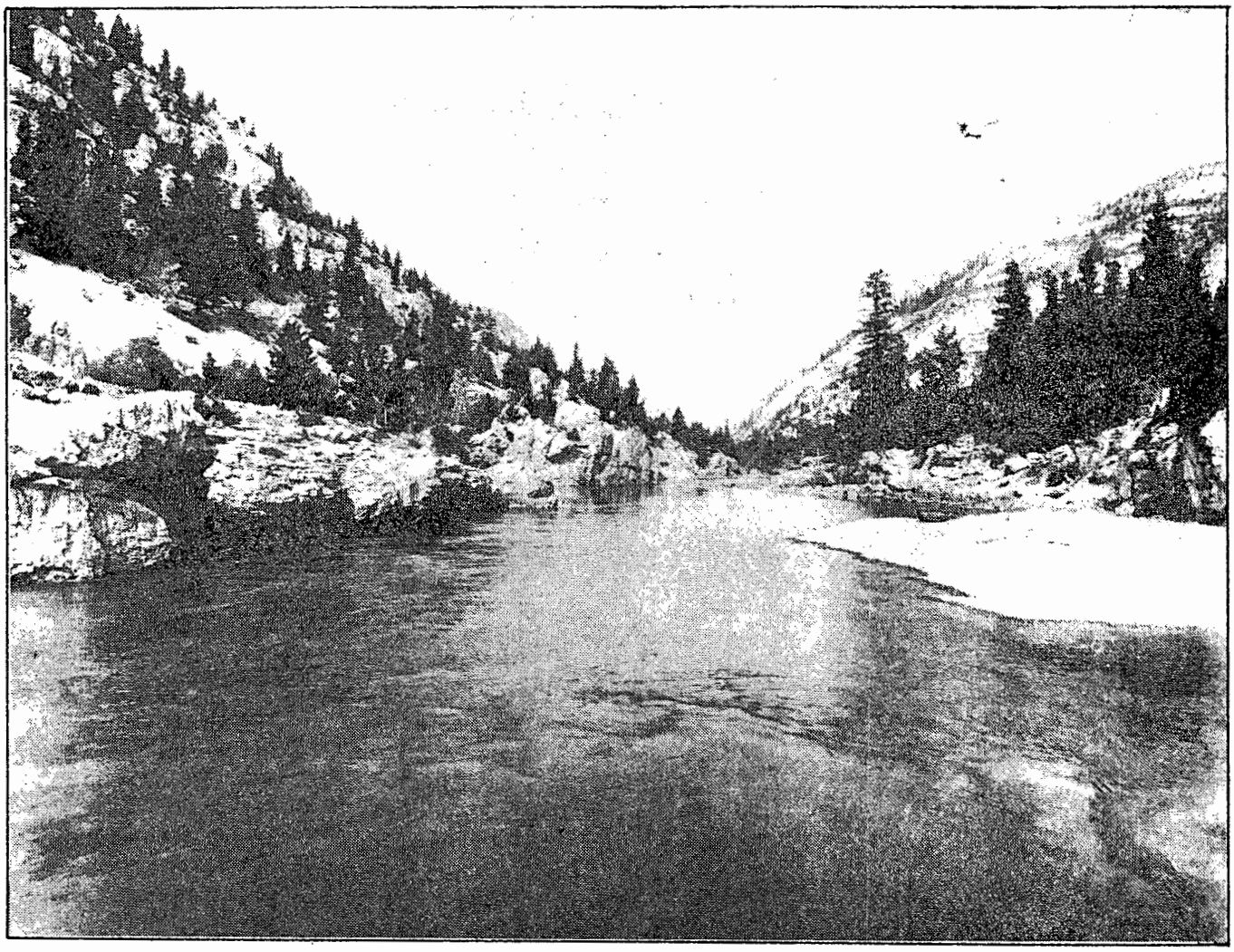
RESEARCH NATURAL AREAS	One 3,281 acre area, Paine Gulch, near Monarch in the Little Belts, has been proposed as a research natural area. Other parts of the Forest are candidates. These are the Front Range, Walling Reef, and Sawtooth Ridge on the Rocky Mountain Division; Big Snowies; Jumping Creek in the Little Belts; Onion Park in the Tenderfoot Experiment Station; and Bartleson Peak.
Changes Between Draft and Final EIS	A table showing the Research Natural Area objectives has been added in response to public comment.
Management Concern	- How can the Forest identify candidate research natural areas containing specific grassland, shrub, and forest habitat types and aquatic ecosystems to meet Regional targets?
All Alternatives	The Northern Region has assigned 18 habitat types and 4 aquatic ecosystems to the Lewis and Clark. Paine Gulch may fill 11 habitat types and 1 aquatic ecosystems. Table 2.4 on the next page shows the Research Natural Area objectives. Other candidate areas may fill the remaining targets, except waterfalls. Further field work is needed to verify the location of these habitat types. If verified, these candidate areas may be proposed by the Forest as Research Natural Areas. Under all alternatives, the proposed and candidate areas will be protected until the presence or absence of the habitat types is verified.

TABLE 2.4

Research Natural Area Objectives

Habitat Type Code	Habitat Type Abbrev.	Habitat Type Name	Occurance*	Proposed/ Candidate RNA
Forest Types				
010		Scree	M	Paine Gulch/ Walling Reef
091	PIFL/AGSP	limber pine/ bluebunch wheat-grass	m	Paine Gulch
092	PIFL/FEID	limber pine/ Idaho fescue	m	Paine Gulch
094	PIFL/FEID-FESC	limber pine/ Idaho fescue-rough fescue phase	m	Walling Reef
220	PSME/FEID	Douglas fir/Idaho fescue	M	Paine Gulch
290	PSME/LIBO	Douglas fir/twin-flower	M	Paine Gulch
310	PSME/SYAL	Douglas fir/snow-berry	M	Paine Gulch
340	PSME/SPBE	Douglas fir/white spirea	m	Paine Gulch
350	PSME/ARUV	Douglas fir/ kinnikinnick	m	Paine Gulch
360	PSME/JUCO	Douglas fir/juniper	M	Paine Gulch
410	PICEA/EQAE	spruce/horsetail	m	Jumping Creek
460	PICEA/SEST	spruce/groundsel	m	Bartleson Peak Big Snowy
770	ABLA/CLPS	subalpine fir/ virgin's bower	m	Paine Gulch
780	ABLA/ARCO	subalpine fir/ heartleaf arnica	M	Little Belt/ Big Snowy
		Aspen	M	Front Range
Grassland and Shrubland Types				
021	DECA/CAREX	tufted hairgrass/ sedge	m	Onion Park/ Walling Reef
034	POFR/FESC	shrubby cinquefoil/ rough fescue	m	Walling Reef
034	POFR/FEID	shrubby cinquefoil/ Idaho fescue	m	
Aquatic Types				
001		Type 1 Streams		Onion Park/Jumping Creek
		Waterfalls		Front Range
		Cold Springs		Paine Gulch/Walling Reef
		Beaver Ponds		Jumping Creek
		Lake, Low Prod.		Walling Reef

* M = major occurance satisfied by representation of 50 acres.
m = minor occurance satisfied by representation of 10 acres.



Sun River in the Rocky Mountain Front.

WILDERNESS, WILDERNESS STUDY, AND ROADLESS	National Forest System Wilderness is managed under the Wilderness Act of 1964 and the Code of Federal Regulations - Title 36 Part 293 - Wilderness Primitive Areas.
Changes Between Draft and Final EIS	This section has been reorganized, the same information is presented. The wilderness recommendation under Alternative G (Preferred) has been increased in response to public comment.
Public Issues	- Should the amount of wilderness use be controlled and how? - Should the Deep Creek-Reservoir North RARE II further planning area be recommended to Congress for inclusion in the National Wilderness Preservation System? - Which roadless areas on the Lewis and Clark National Forest should be recommended to Congress for wilderness designation?
Comparison	There are currently 384,407 acres of wilderness on the Forest. This is part of the Bob Marshall-Great Bear-Scapegoat Wilderness complex, which will be managed the same under all alternatives. Twenty-three roadless areas on the Forest were evaluated for wilderness in the 1979 RARE II (Roadless Area Review and Evaluation) FEIS. Two of these areas were recommended for wilderness, 1 for further planning, and 20 for nonwilderness. Of the areas recommended for wilderness or further planning by the Forest, none are now classified. Since 1979, management activities such as timber harvest and road construction have reduced the roadless acreage of some of these areas, and acreages recalculations (not boundary changes) have altered some acreages. These changes are listed in Table 2.5. Three of the roadless areas extend into other Forests. Although these areas are divided by adminstrative boundaries, they have been evaluated in their entirety. Bear-Marshall-Scapegoat-Swan (1-485) is on the Flathead, Helena, Lolo, and Lewis and Clark National Forests. This area is contiguous to the Bob Marshall, Great Bear, and Scapegoat Wilderness Complex. The area is noncontiguous pieces that surround the Bob Marshall complex. Six portions are on the Lewis and Clark

Forest, and varying amounts of each part are recommended for wilderness in the alternatives. The wilderness/nonwilderness decision for 1-485 will be made and documented in each Forest's Environmental Impact Statement, Record of Decision for their specific area. The information supporting the decision is in Appendix C of this FEIS.

The Box Canyon (1-742) and Crazy Mountains (1-541) are on the Gallatin and Lewis and Clark National Forests. The wilderness/nonwilderness decision for Box Canyon and Crazy Mountains will be made and documented in each Forest's Environmental Impact Statement and Record of Decision for their specific area. The information supporting the decision is in Appendix C of this FEIS.

TABLE 2.5 ROADLESS AREA INVENTORY

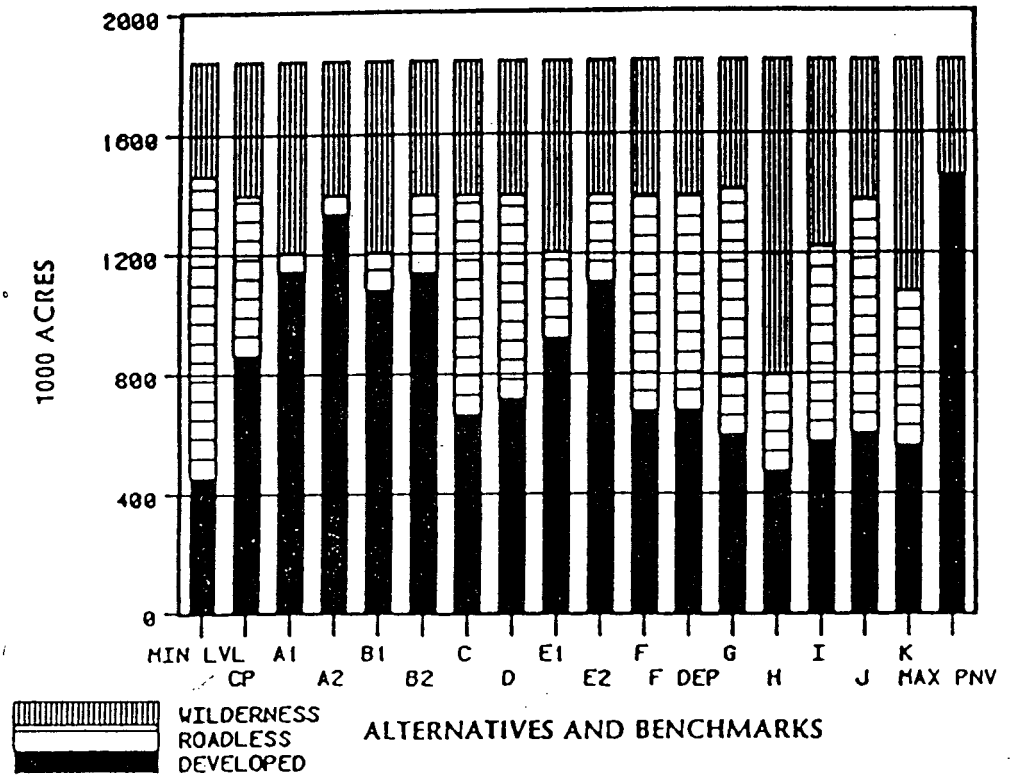
Area ID No.	Area Name	RARE II Net Acres	Change In Acres	Reason For Change	Revised Net Acres
1-485	Bear-Marshall				
	Scapegoat-Swan	758,479	+105,302	Timber harvest and roads.	863,781
	Flathead NF Portion *	246,879	+102,071	Addition of acres released	348,950
	Lewis & Clark NF Portion	328,400	+8,228	from Great Bear Wilderness	336,628
	Helena NF Portion	61,000	-3,697	Study.	57,303
	Lolo NF Portion	122,200	-1,300		120,900
1-541	Crazy Mountains	87,991	-893	Private land access and	87,098
	Lewis & Clark NF Portion	16,600		timber harvest.	16,600
	Gallatin NF Portion	71,391	-893		70,498
1-721	Sawtooth	15,500			15,500
1-726	Tenderfoot-Deep Creek	94,600	-6,200	Roading due to mining activity and timber harvest.	88,400
1-727	Pilgrim Creek	49,500			49,500
1-728	Paine Gulch	8,500			8,500
1-729	Sawmill Creek	12,800			12,800
1-730	TW Mountain	8,200	+300	Inventory correction.	8,500
1-731	Big Baldy	44,000			44,000
1-732	Granite Mountain	11,300	-720	Timber harvest and roads.	10,580
1-733	Tollgate-Sheep	29,200	-2,400	Timber harvest and roads.	26,800
1-734	Middle Fork Judith	91,000	+1,000	Inventory correction.	92,000
1-735	Mount High	32,300			32,300
1-737	Highwood-Baldy	15,600			15,600
1-738	Highwoods	24,100			24,100
1-739	Big Snowies	121,600	-23,715	Inventory correction.	97,885
1-740	Bluff Mountain	37,600	-480	Timber harvest and roads.	37,120
1-741	Spring Creek	21,400	-1,600	Timber harvest and roads.	19,800
1-742	Box Canyon	14,367	-2,720	Private land timber harvest and	11,647
	Lewis & Clark NF Portion	12,500	-2,600	twin 500KV powerline mining act-	9,900
	Gallatin NF Portion	1,867	-120	ivity and roading for microwave tower.	1,747
1-743	Castle Mountains	30,800	-1,200	Timber harvest and roads.	9,600
MWSA Middle Fork Judith		92,000			92,000
MWSA Big Snowies		97,885			97,885

* Includes Swan Crest, Swan Front, Middle Fork and East South Fork - Flathead.

Comparison

Wilderness, roaded, and roadless acreages by alternative are shown in Figure 2.6. Some of the current roadless inventory of 1,002,232 acres is assigned to roaded, continued roadless, or wilderness management in all alternatives. These assignments depend on the overall goals and objectives of each alternative. There are currently 384,407 acres of wilderness on the Forest. This is part of the Bob Marshall/Great Bear/Scapegoat Wilderness complex, which will be managed the same under all alternatives.

FIGURE 2.6 WILDERNESS, ROADLESS AND DEVELOPED LAND (2130)



Alternatives A-1 , B-1 and E-1	These alternatives recommend 252,189 acres for wilderness classification -- Silver King-Falls Creek, Renshaw, Middle Fork Judith, and Big Snowies.
Alternatives A-2, B-2, C, D, E-2, F, F-Departure	These alternatives recommend 63,304 acres for wilderness classification -- all of the Silver King-Falls Creek and Renshaw Roadless Areas.
Alternative G-Preferred	The Preferred Alternative (G) recommends 51,834 acres* along the east slope of the Rocky Mountains for wilderness classification (part of the Silver King-Falls Creek and Renshaw and Teton Peaks and Benchmark-Elk Creek areas). *46,844 acres DEIS-Supplement. This recommendation is a preliminary administrative recommendation that will receive further review and possible modification by the Chief of the Forest Service, the Secretary of Agriculture, and the President of the United States. Final decisions on wilderness designation have been reserved by the Congress to it self.
Alternative H	This alternative recommends 664,326 acres (all roadless areas except Badger-Two Medicine and Deep Creek-Reservoir North) be classified as wilderness. Commodity outputs would be increased from these lands that are presently developed.
Alternative I	This alternative recommends 235,704 acres for wilderness classification--Silver King-Falls Creek, Renshaw, Tenderfoot-Deep Creek and most of the Bear-Marshall-Scapegoat-Swan Roadless Areas.
Alternative J	This alternative recommends 79,005 acres for wilderness classification--parts of Silver King-Falls Creek, Renshaw, and Tenderfoot-Deep Creek.
Alternative K	This alternative recommends 387,106 acres for wilderness classification--Bear-Marshall-Scapegoat-Swan, Silver King-Falls Creek, Renshaw, Crazy Mountains, Tenderfoot-Deep Creek and Pilgrim Creek.

Table 2.6 shows areas recommended for wilderness by alternative. Each roadless area was considered for wilderness in at least one alternative and for non-wilderness in at least one alternative, except for the Badger-Two Medicine and Deep Creek-Reservoir North portions of 1-485.

Appendix C describes the unique characteristics, resources, and wilderness features of each roadless area.

TABLE 2.6 WILDERNESS ALLOCATION OF EACH ROADLESS AREA BY ALTERNATIVE

NAME	NUMBER	Min Level	CP	A-1	A-2	B-1	B-2	*C	D	E-1
Rocky Mountain Division										
Bear-Marshall-Scapegoat-Swan	1-485	0	137,464	137,464	137,464	137,464	137,464	137,464	137,464	137,464
Flathead		0	0	0	0	0	0	0	0	0
Helena		0	7,215	7,215	7,215	7,215	7,215	7,215	7,215	7,215
Lolo		0	66,945	66,945	66,945	66,945	66,945	66,945	66,945	66,945
Lewis and Clark		0	63,304	63,304	63,304	63,304	63,304	63,304	63,304	63,304
Badger-Two Medicine		0	0	0	0	0	0	0	0	0
Teton		0	0	0	0	0	0	0	0	0
*Deep Creek-Reservoir North		0	0	0	0	0	0	0	0	0
Renshaw		0	31,304	31,304	31,304	31,304	31,304	31,304	31,304	31,304
Benchmark-Elk Creek		0	0	0	0	0	0	0	0	0
Silver King-Falls Creek		0	32,000	32,000	32,000	32,000	32,000	32,000	32,000	32,000
Sawtooth	1-721	0	0	0	0	0	0	0	0	0
Jefferson Division										
Crazy Mountains	1-541	0	0	0	0	0	0	0	0	0
Gallatin										
Lewis and Clark										
Tenderfoot-Deep Creek	1-726	0	0	0	0	0	0	0	0	0
Pilgrim Creek	1-727	0	0	0	0	0	0	0	0	0
Paine Gulch	1-728	0	0	0	0	0	0	0	0	0
Sawmill Creek	1-729	0	0	0	0	0	0	0	0	0
TW Mountain	1-730	0	0	0	0	0	0	0	0	0
Big Baldy	1-731	0	0	0	0	0	0	0	0	0
Granite Mountain	1-732	0	0	0	0	0	0	0	0	0
Tollgate-Sheep	1-733	0	0	0	0	0	0	0	0	0
Mount High	1-735	0	0	0	0	0	0	0	0	0
Highwood-Baldy	1-737	0	0	0	0	0	0	0	0	0
Highwoods	1-738	0	0	0	0	0	0	0	0	0
Bluff Mountain	1-740	0	0	0	0	0	0	0	0	0
Spring Creek	1-741	0	0	0	0	0	0	0	0	0
Box Canyon	1-742	0	0	0	0	0	0	0	0	0
Gallatin										
Lewis and Clark										
Castle Mountains	1-743	0	0	0	0	0	0	0	0	0
North Fork of Smith	1-744	0	0	0	0	0	0	0	0	0
Calf Creek	1-745	0	0	0	0	0	0	0	0	0
Eagle Park	1-746	0	0	0	0	0	0	0	0	0
Middle Fork Judith - MWSA		0	0	92,000	0	92,000	0	0	0	92,000
Big Snowies - MWSA		0	0	97,885	0	97,885	0	0	0	97,885

The Badger-Two Medicine area is unavailable because of the Blackfeet Treaty rights on the area. The Deep Creek-Reservoir North was selected for further planning under the RARE II study, and the entire area is now leased for oil and gas. However, suit has been filed in U.S. District Court to review the leases. Because of the undetermined mineral potential and pending litigation, the area will remain in a further planning status. Once oil and gas potential is known, a wilderness recommendation would be made through an amendment to the Forest Plan.

TABLE 2.6

E-2	F	F(Dep)	G(Pref)	H	I	J	K	Max PNV
137,464	137,464	137,464	215,474	632,806	368,039	29,505	544,606	0
0	0	0	96,695	264,600	143,300	0	176,400	0
7,215	7,215	7,215	0	58,700	72,150	0	58,700	0
66,945	66,945	66,945	66,945	120,900	70,202	0	120,900	0
63,304	63,304	63,304	51,834	188,606	147,304	29,505	188,606	0
0	0	0	0	0	0	0	0	0
0	0	0	10,870	36,133	39,845	0	63,133	0
0	0	0	0	0	0	0	0	0
31,304	31,304	31,304	19,144	57,591	45,864	21,880	57,591	0
0	0	0	3,630	32,314	26,027	0	32,314	0
32,000	32,000	32,000	18,190	35,568	35,568	7,625	35,568	0
0	0	0	0	15,500	0	0	0	0
0	0	0	0	16,600	0	0	16,600	0
0	0	0	0	88,400	88,400	49,500	88,400	0
0	0	0	0	49,500	0	0	0	0
0	0	0	0	8,500	0	0	0	0
0	0	0	0	12,800	0	0	0	0
0	0	0	0	8,500	0	0	0	0
0	0	0	0	44,000	0	0	44,000	0
0	0	0	0	10,580	0	0	0	0
0	0	0	0	26,800	0	0	0	0
0	0	0	0	32,300	0	0	0	0
0	0	0	0	15,600	0	0	0	0
0	0	0	0	24,100	0	0	0	0
0	0	0	0	37,120	0	0	0	0
0	0	0	0	19,800	0	0	0	0
0	0	0	0	9,900	0	0	0	0
0	0	0	0	29,600	0	0	0	0
0	0	0	0	8,800	0	0	0	0
0	0	0	0	11,020	0	0	0	0
0	0	0	0	6,300	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

Table 2.7 shows how the roadless resource would be managed under different alternatives. The term managment emphasis is used to indicate which resource activity is highlighted. If the emphasis is range, most of the activity in the area would be for range management. Resource activities which are compatible with the emphasis will continue, but with less intensity. The table below lists the acres of each management emphasis by alternative. Similar information is given for each roadless area in Appendix C.

TABLE 2.7 ALLOCATION OF ROADLESS ACRES TO MANAGEMENT EMPHASIS BY ALTERNATIVE 1/

Management Emphasis	MIN LEVEL	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2
Min. Level Mgmt	1002233	415244	374032	377998	344391	453661	619800	608627	343873	405596
Range Mgmt	0	144472	88249	116037	112539	142497	125359	139259	105522	128485
Timber Mgmt	0	109888	148060	218239	188272	245263	33707	51791	149303	249605
Timber/Range Mgmt	0	0	26940	49905	15016	8846	3813	2447	17177	19754
Timber/Wildlife Visual Mgmt	0	3700	8832	36376	9944	13816	1872	5541	34180	30908
Timber/Range/Wildlife/Visual Mgmt	0	25	472	570	4408	494	0	370	964	915
Wildlife Mgmt	0	33877	57040	78963	26807	30520	102106	84961	53226	57867
Wildlife/Range Mgmt	0	0	4581	19003	6829	1994	10534	4095	3961	3961
Wilderness Mgmt	0	63304	252189	63304	252189	63304	63304	63304	252189	63304
Wilderness Study Mgmt	0	231723	41838	41838	41838	41838	41838	41838	41838	41838
Campground Mgmt	0	0	0	0	0	0	0	0	0	0
Concentrated Recreation Mgmt	0	0	0	0	0	0	0	0	0	0
Concentrated Recreation/Range Mgmt	0	0	0	0	0	0	0	0	0	0
Concentrated Recreation/Timber Mgmt	0	0	0	0	0	0	0	0	0	0
Concentrated Recreation/Timber/Range Mgmt	0	0	0	0	0	0	0	0	0	0
TOTAL	1002233	1002233	1002233	1002233	1002233	1002233	1002233	1002233	1002233	1002233

1/ A description of the FORPLAN prescription grouped into management emphasis is given in Appendix C, DEIS. Minerals and energy activities may occur anywhere in the area, except wilderness.

ACRES	MIN LEVEL	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2
Wilderness	0	63304	252189	63304	252189	63304	633304	63304	252189	63304
Roadless Managment	1002233	530801	58936	57936	120136	254596	730449	675629	282484	284984
Decade 1	1002233	912809	708144	897029	723924	913409	923129	924929	723924	912809
Decade 5	1002233	675401	337188	336188	263886	476221	791929	735209	331584	448594
Developed	0	408128	691108	880993	629908	684333	207980	263300	467560	653945
Decade 1	0	26120	41900	41900	26120	25520	15800	14000	26120	26120
Decade 5	0	263528	412586	602741	486158	462708	147000	203720	418460	490335

A summary of management emphasis is displayed at the end of the table to show how the roadless resource will be affected through time. The roaded category indicates the rate of access into roadless lands. Areas that may be roaded for mineral activities are not included. The roadless category is a sum of roadless areas greater than 5,000 acres in size which will be available for future consideration of wilderness.

TABLE 2.7 ALLOCATION OF ROADLESS ACRES TO MANAGEMENT EMPHASIS BY ALTERNATIVE 1/

	ALT F	ALT F (Depart)	ALT G (Prefer)	ALT H	ALT I	ALT J	ALT K	MAX PNV
Min. Level Mgmt	686142	673320	656728	235004	482048	634058	361961	501683
Range Mgmt	77472	69469	120090	61065	115151	120493	126811	0
Timber Mgmt	57987	68419	38900	0	34300	38858	7276	267643
Timber/Range Mgmt	27049	29261	14937	0	17235	18351	11094	31431
Timber/Wildlife Visual Mgmt	836	644	12238	0	10090	6650	2621	69772
Timber/Range/Wildlife/Visual Mgmt	0	0	1236	0	1278	1615	618	0
Wildlife Mgmt	38236	50798	53630	0	48150	55652	52347	176
Wildlife/Range Mgmt	9315	5123	10684	0	15202	4671	10424	0
Wilderness Mgmt	63304	63304	51834	664326	235704	79005	387106	84883
Wilderness Study Mgmt	41838	41838	41838	41838	41838	41838	41838	41838
Campground Mgmt	0	0	0	0	0	0	0	0
Concentrated Recreation Mgmt	40	38	60	0	650	547	59	4807
Concentrated Recreation/Range Mgmt	14	9	58	0	587	495	78	0
Concentrated Recreation/Timber Mgmt	0	0	0	0	0	0	0	0
Concentrated Recreation/Timber/Range Mgmt	0	10	0	0	0	0	0	0
TOTAL	1002233	1002233	1002233	1002233	1002233	1002233	1002233	1002233

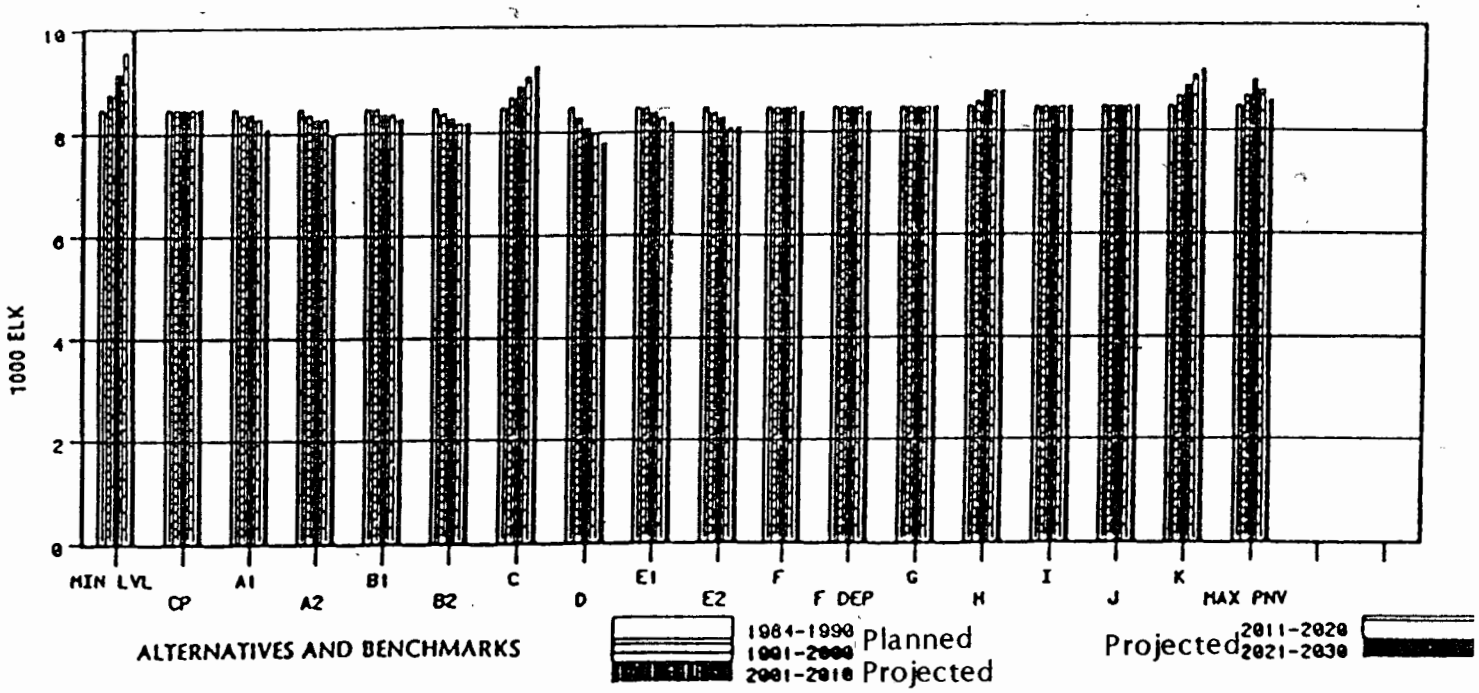
Summary of Management Emphasis Allocated to Roadless Area.

	ALT F	ALT F(Dep)	ALT G	ALT H	ALT I	ALT J	ALT K	MAX PNV
Wilderness	63304	63304	51834	664326	235704	79005	387106	0
Roadless Management	715609	713809	856669	319107	649389	777188	510647	0
Decade 1	912809	911009	943429	337907	754269	908408	607327	976113
Decade 5	715609	713809	856669	319107	649389	777188	510647	0
Developed	223320	225120	139720	18800	117140	146040	104480	1002233
Decade 1	26120	27920	17960	0	12260	14760	7300	26120
Decade 5	223320	225120	98720	18800	17140	146040	104480	100233

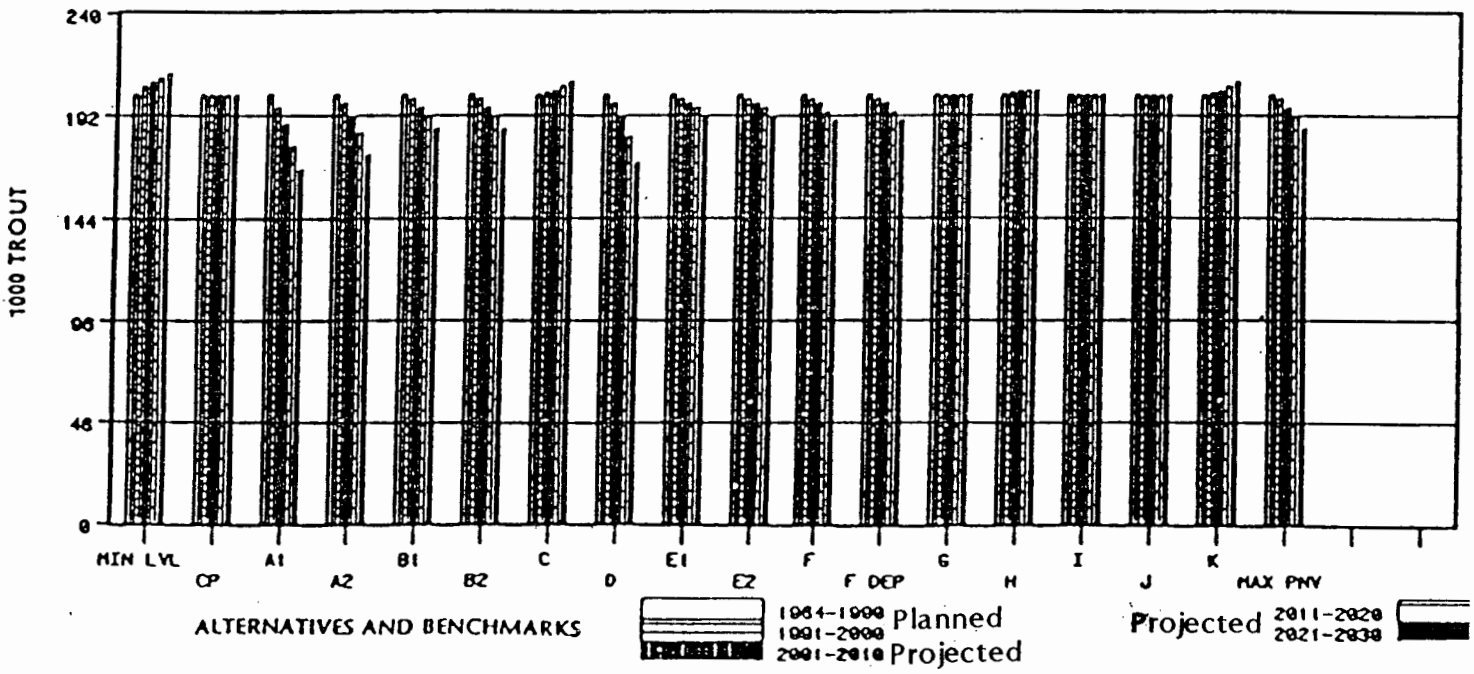
WILDLIFE - T & E SPECIES	Threatened and endangered species are managed in compliance with the Endangered Species Act, other related laws, executive orders, Forest Service Manual direction, and NFMA implementing regulations. The Jefferson Division has a small amount of unoccupied peregrine falcon and bald eagle habitat. The Rocky Mountain Division has unoccupied peregrine falcon and bald eagle habitat and occupied grizzly bear and gray wolf habitat.
Changes Between Draft and Final EIS	Additional information on T&E species habitat has been included in response to public comment.
Public Issue	- How much oil and gas activity can be accepted and still meet the intent of the Endangered Species Act?
Grizzly Bear	The grizzly bear on the Lewis and Clark Forest occupies part of the Northern Continental Divide Ecosystem. A complete description of the ecosystem is discussed in Chapter III. Current grizzly bear population is estimated at 85 bears. Occupied grizzly bear habitat is disaggregated into Management Situations 1, 2 and 3, and they are fully described in Chapter III. There are 763,889 acres in Management Situation 1, 4,070 acres in Management Situation 2, and 8,300 acres in Management Situation 3. Oil and gas leases exist on 281,479 acres of Management Situation 1 and 12,370 acres of Management Situation 2 and 3. The inclusion in the leases of occupancy restrictions and scheduling of exploration activities to achieve spacing in time and location helps minimize disturbance to grizzly bear. See Chapter IV for a discussion of these effects. Occupied grizzly bear habitat exists in the Bob Marshall and Scapegoat wilderness areas and consists of 384,407 acres of Management Situation 1.
All Alternatives	Under all alternatives, habitat capacity will be maintained for a recovery goal level of 81 bears. Alternatives A-1, A-2, B-1, B-2, D, F and F Departure have a higher potential for human/grizzly conflicts.
Gray Wolf	Gray wolf are occassionally observed on the Rocky Mountain Division. Most of the sightings are single animals. The Northern Rocky Mountain Wolf Recovery Plan indicates a population level of 10 for the Lewis and Clark National Forest. Current population estimates are 4-8 wolves.

All Alternatives	Habitat capacity for supporting 10 gray wolves will be provided under all alternatives. However, the potential for human/wolf conflicts would increase under Alternatives A-1, A-2, B-1, B-2, D, F and F Departure.
Peregrine Falcon and Bald Eagle	Under all alternatives the unoccupied habitat will be protected and the Forest will work the the USDI, Fish and Wildlife Service in recovery efforts.
WILDLIFE AND FISH	Currently there are an estimated 8,500 elk and 202,000 catchable trout within the Forest. Elk hunting provides about 65,000 hunter days of recreation annually. Elk hunter days are used to express elk hunting opportunity and habitat quantity. A variety of wildlife habitat improvement projects, including fencing, planting forage species, prescribed burning, water development, bank stability and cover, pool development, and barrier removal, are done to maintain and improve wildlife habitat.
Changes Between Draft and Final EIS	None.
Public Issues	- How much fish and wildlife habitat should be improved and to what extent? - How and where should range be provided for elk and cattle? - How should conflicts be resolved between wildlife and management activities of: livestock grazing; timber; oil and gas exploration and development; minerals; recreation; and wilderness?
Comparison	Figures 2.7, 2.8, and 2.9 show elk population potential, catchable trout population potential, and wildlife habitat improvement by alternative, minimum level benchmark, and maximum PNV benchmark. Figure 2.10 shows elk hunter days.

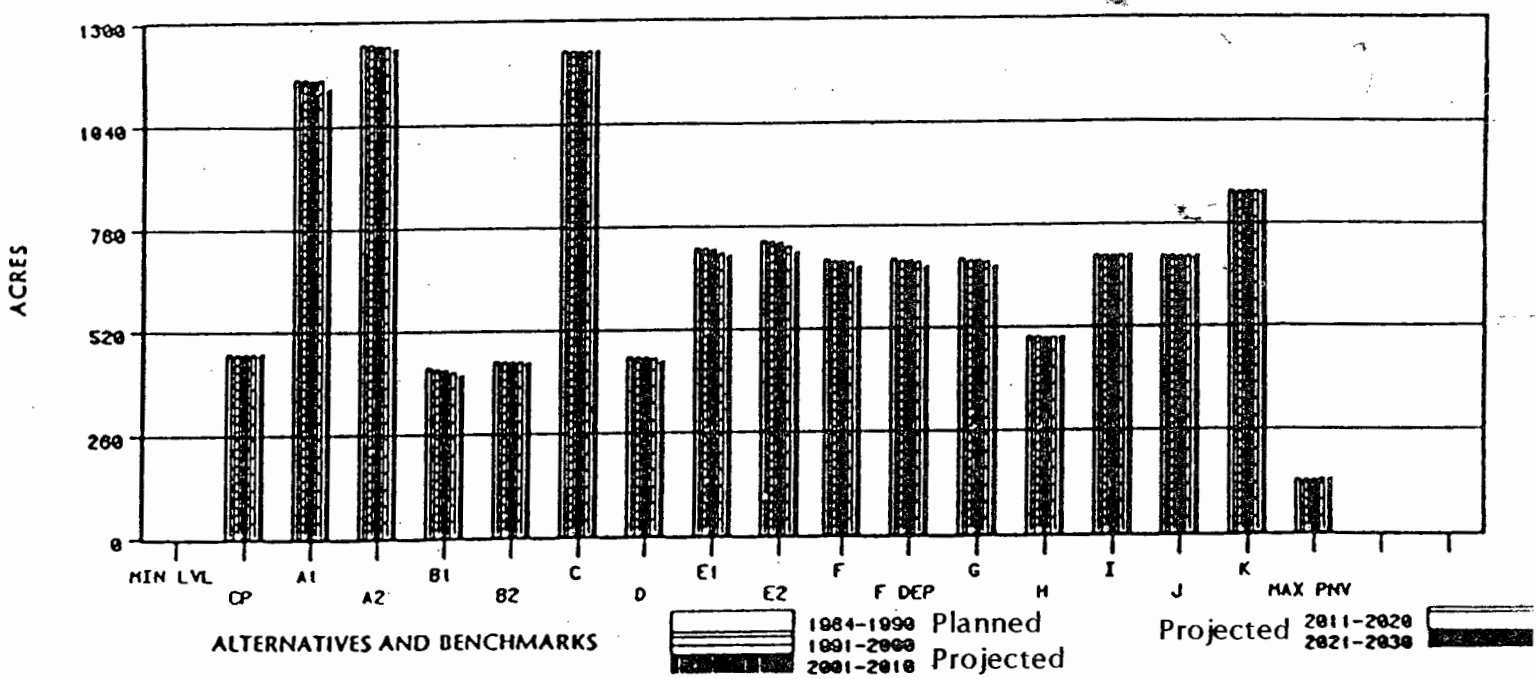
ELK POPULATION POTENTIAL FIGURE 2.7



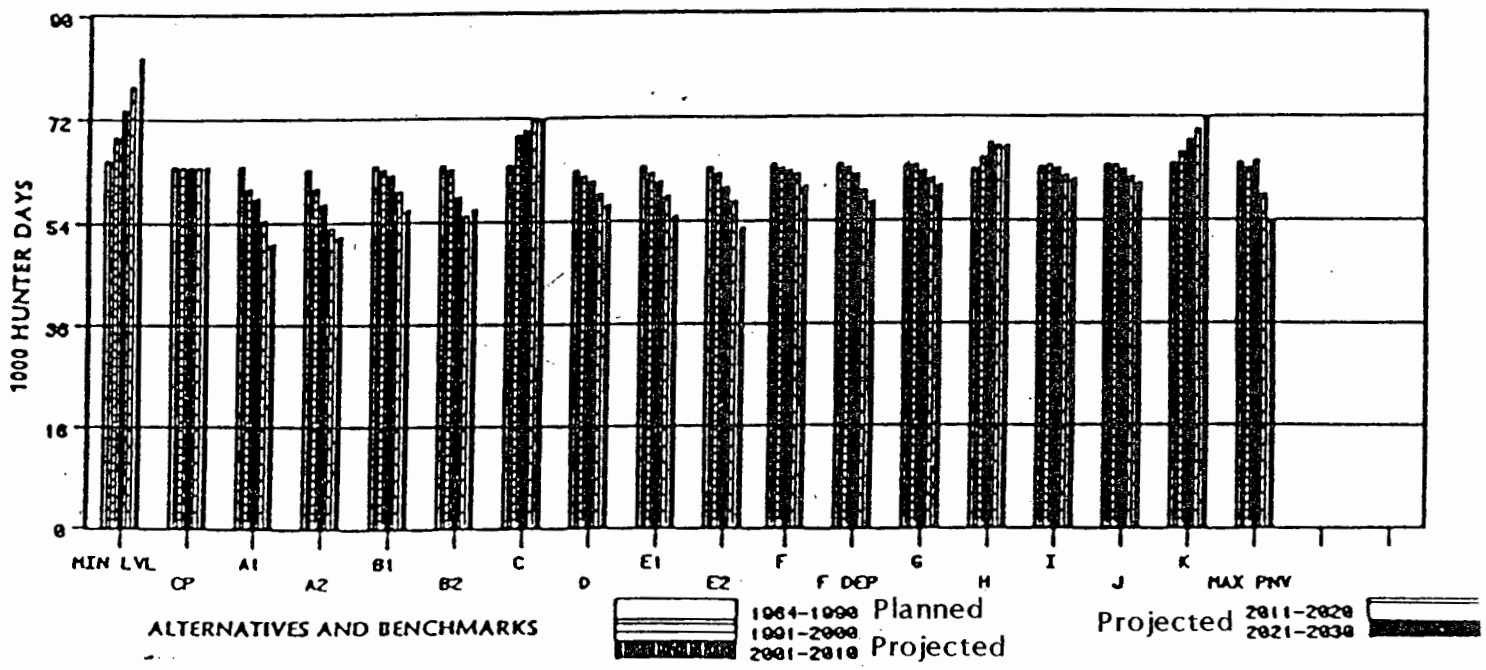
CATCHABLE TROUT POPULATION POTENTIAL FIGURE 2.8



WILDLIFE HABITAT IMPROVEMENT FIGURE 2.9



ELK HUNTER DAYS FIGURE 2.10



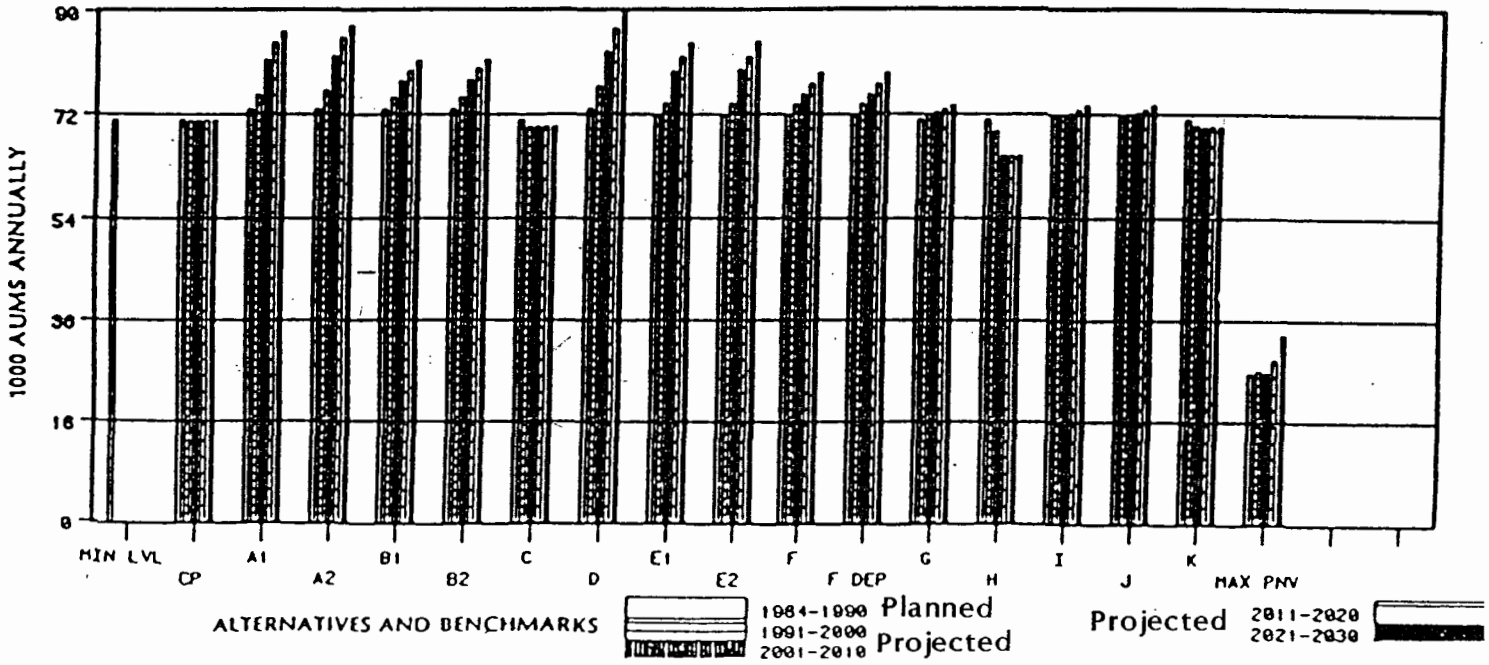
All Alternatives	Coordination between wildlife and fish habitat management and other management activities would be emphasized under all alternatives. Elk is one of the big-game indicator species. Deer habitat potential on the Forest is expected to be affected in a similar manner by the alternatives. Wildlife and fish population numbers displayed in the EIS are an expression of the habitat potential. Other factors outside Forest Service control such as length of hunting seasons, bag limits, and weather, influence the actual population numbers that will exist at any given time period. Timber harvest activities would provide transitory forage for big game, but timber harvest openings would reduce hiding cover and the roads constructed allow easier hunter access. Hiding cover effectiveness and road use management will be used to provide adequate elk security. On areas identified as big-game winter range, elk and livestock would compete for the available forage. Increased livestock use on big-game winter range would leave less forage for elk. The amount of sediment in streams would increase as the miles of new road for timber harvest activities increases. Increased livestock grazing of riparian vegetation along streams could adversely effect fish populations.
Current Plan	Under current management, elk and catchable trout populations would not change. Elk hunter recreation days would not change. Wildlife habitat improvement would be done on 466 acres annually.
Alternative A-1	By 2030, elk population would decrease from 8,500 to 8,100 because of increases in grazing on winter range and timber harvesting on unroaded lands. Elk hunter recreation would decrease by 13,500 days annually. Catchable trout would decrease from 202,000 to 167,000 because of increased grazing and harvesting timber in the riparian zone. Annual wildlife habitat improvement would increase to 1,138 acres.
Alternative A-2	By 2030, elk population would decrease from 8,500 to 8,000 and catchable trout would decrease from 202,000 to 174,000, because of increases in grazing and timber harvesting. Elk hunter recreation would decrease by 11,700 days annually. Wildlife habitat improvement would increase to 1,236 acres annually.

Alternative B-1	By 2030, there would be a decrease in elk population from 8,500 to 8,300 and catachable trout from 202,000 to 186,000, because of increases in grazing and timber harvesting. Annual wildlife habitat improvement would be 410 acres (just below the current level). Elk hunter recreation would decrease by 7,600 days annually.
Alternative B-2	By 2030, there would be a decrease in elk population from 8,500 to 8,200 and catchable trout from 202,000 to 186,000, because of increases in grazing and timber harvesting. Wildlife habitat improvement would decrease slightly to 440 acres. Elk hunter recreation would decrease by 7,600 days annually.
Alternative C	This alternative would protect and improve wildlife areas. Annual wildlife habitat improvement would be 1,228 acres. By 2030, the elk population would increase from 8,500 to 9,300 elk. The catchable trout population would increase from 202,000 to 208,000 fish. Elk hunter recreation would increase by 8,000 days annually. The removal of some livestock from winter ranges provide more forage for big game.
Alternative D	By 2030, elk population would decrease from 8,500 to 7,800 and catchable trout from 202,000 to 170,000, because of the increased grazing in riparian areas. Wildlife habitat improvement would increase to 440 acres. Elk hunter recreation would decrease by 6,000 days annually.
Alternative E-1	By 2030, elk population would decrease from 8,500 to 8,200 and catchable trout from 202,000 to 192,000, reflecting the increased grazing and timber harvesting. Annual wildlife habitat improvements would increase to 710 acres. Elk hunter recreation would decrease by 8,500 days annually.
Alternative E-2	By 2030, elk population would decrease from 8,500 to 8,100 and catchable trout from 202,000 to 192,000, reflecting the increased grazing and timber harvesting. Annual wildlife habitat improvement would increase to 718 acres. Elk hunter recreation would decrease by 10,900 days annually.

Alternative F	By 2030, elk population would decrease from 8,500 to 8,400, because of the increased grazing level. Catchable trout would decrease from 202,000 to 190,000. Annual wildlife habitat improvement would increase to 678 acres. Elk hunter recreation would decrease by 3,800 days annually.
Alternative F-Departure	By 2030, elk population would decrease from 8,500 to 8,400, because of the increased grazing level. Catchable trout would decrease from 202,000 to 190,000. Annual wildlife habitat improvement would increase to 678 acres. Elk hunter recreation would decrease by 6,600 days annually.
Alternative G -Preferred	The habitat capacity for elk and catchable trout populations would not change. Annual wildlife habitat improvement would increase to 950 acres. By 2030, elk hunter recreation would decrease by 3,500 days annually because of increased timber harvest and roading.
Alternative H	By 2030, the habitat capacity for elk would increase from 8,500 elk to 8,800 elk. Habitat capacity for catchable trout would increase from 202,000 to 204,000 fish. Wildlife habitat improvement would be done on about 500 acres yearly. Elk hunter recreation would increase by 4,000 days annually.
Alternative I	The habitat capacity for elk and catchable trout populations would not change. Wildlife habitat improvement would be done on about 700 acres yearly. By 2030, elk hunter recreation would decrease by 2,200 days annually.
Alternative J	The habitat capacity for elk and catchable trout populations would not change. Wildlife habitat improvement would be done on about 700 acres yearly. By 2030, elk hunter recreation would decrease by 3,200 days annually.
Alternative K	By 2030, the habitat capacity for elk would increase from 8,500 elk to 9,200 elk. The removal of some livestock from winter ranges would provide more forage for big game. Habitat capacity for catchable trout would increase from 202,000 to 208,000 fish. Wildlife habitat improvement would be done on 863 acres yearly. Elk hunter recreation would increase by 8,000 days annually.

RANGE	The current livestock grazing level is 71,000 AUMs.
Changes Between Draft and Final EIS	None.
Public Issues	- How much livestock grazing should be provided? - How and where should range be provided for cattle? - Can and should the range structural and non-structural improvement program be improved and how? - How can control of noxious weeds be improved and to what extent? - What are the effects of the following on livestock grazing: Clean Water Act; early hunting season; wilderness management; wildlife management; timber management; and recreation management? How can these impacts be resolved?
Comparison	Figure 2.11 displays livestock grazing AUMs for the alternatives, minimum level benchmark, and maximum PNV benchmark.

FIGURE 2.11 LIVESTOCK GRAZING



All Alternatives	The control of noxious weeds would be the same under all alternatives. The amount of range improvement to increase forage production would vary between alternatives. Most of the livestock permittees are local individuals whose farm or ranch operations are dependent on National Forest forage. Increased grazing on big-game winter range would limit or decrease elk habitat potential.
Current Plan	Under current management, grazing would remain at 71,000 AUMs during the planning period. Current management would not allow range deterioration caused by livestock and would improve distribution of animals on existing allotments.
Alternative A-1	Grazing would increase from 71,000 to 86,400 AUMs, by 2030. The alternatives would strive to meet RPA objectives and show a grazing increase, second only to Alternative D. The increase would be from harvesting timber to create transitory range, making moderate investments in range improvements, and establishing new allotments.
Alternative A-2	Grazing would increase from 71,000 to 87,500 AUMs, by 2030. The 1,100 AUM increase from A-1 would reflect the intensive grazing in many areas including the Middle Fork Judith and Big Snowies. Both A-1 and A-2 would allow grazing in the MWSA areas, but A-2 recommend nonwilderness for both areas and schedule more intensive management. This increase would be achieved as described in A-1.
Alternative B-1	Grazing would increase from 71,000 to 81,400 AUMs, by 2030. This increase would be achieved by harvesting timber to create transitory range, making low investments in range improvement, and establishing new allotments.
Alternative B-2	Grazing would increase from 71,000 to 81,500 AUMs, by 2030. The slight AUM increase between B-1 and B-2 would be because the MWSA areas B-2 recommends nonwilderness.
Alternative C	Grazing would decrease from 71,000 to 70,000 AUMs, by 2030. Alternatives C, H, and K are the only alternatives that decrease grazing. Because C emphasizes protecting key wildlife habitat areas, the livestock grazing slightly decreases.
Alternative D	Alternative D's goal is to increase both livestock grazing and outdoor recreation opportunity. Grazing would increase from 71,000 to 89,900 AUMs, by 2030. This increase would be from harvesting timber to create transitory range, making high investments in

	range improvements, and establishing new allotments. Some of the AUM increase would be on elk winter range. Therefore, the elk population potential and elk hunter days would decrease. Alternative D has the greatest AUM increase and the greatest elk population decreases.
Alternative E-1	Grazing would increase from 71,000 to 84,400 AUMs, by 2030. This increase would only be on the Jefferson Division and would be achieved as described in Alternative D. Some of the increase would be on elk winter range, resulting in a decrease in elk population potential. The decrease would be less than in Alternative D.
Alternative E-2	Grazing would increase from 71,000 to 84,700 AUMs, by 2030. This increase would only be on the Jefferson Division and would be achieved as described in Alternative D. As in E-1, some of the AUM increase would be on elk winter range. Because Alternative E-2 recommends the MWSAs for non-wilderness the AUM increase would be slightly higher than in Alternative E-2.
Alternative F and F-Departure	Grazing would increase from 71,000 to 79,200 AUMs, by 2030. Grazing would increase on big-game range and riparian areas, timber would be harvested to create transitory range, moderate investments would be made in range improvements, and grazing distribution would be improved. The range improvements would mitigate most, but not all, of the impacts on elk population potential. By 2030, it is estimated the elk population would decrease by 100.
Alternative G - Preferred I and J	Grazing would increase from 71,000 to 73,600 AUMs, by 2030. To achieve this increase, timber would be harvested to create transitory range, moderate investments would be made in range improvements, and distribution of grazing would be improved through intensive management systems. Improved livestock distribution and less harvesting of timber on steeper lands would help mitigate adverse effects on catchable trout. The elk population would be unchanged.
Alternative H	Grazing would be reduced from 71,000 to 64,800 AUMs because of a reduction of available forage for livestock, because most roadless areas would be recommended for wilderness. In areas allocated to wilderness, programs to control tree and shrub

	encroachment and to maintain or enhance forage production would be foregone. Livestock permittees effected by a reduction in AUMs may have to make adjustments in their farm or ranch operations. The elk population potential would increase from 8,500 to 8,800, by 2030.
Alternative K	Grazing would be reduced from 71,000 to 69,900 AUMs because of a reduction of available forage for livestock. As in Alternative H, the reduction results from recommending several roadless areas for wilderness classification. In areas allocated to wilderness, programs to control tree and shrub encroachment and to maintain or enhance forage production would be foregone. Some livestock permittees would have to make adjustments in their farm or ranch operations. Because of recommending several areas for wilderness, tripling the wildlife improvement program, and decreasing livestock AUMs the elk population potential would increase from 8,500 to 9,200, by 2030.

TIMBER	The current annual timber sale program is 13.0 million board feet per year.
Changes Between Draft and Final EIS	A table showing timber harvest replaces the figures showing the same information in the DEIS-Supplement. The timber harvest schedule has been changed for the Preferred Alternative (G) in response to public comment. Lands suitable for timber management are shown in graphic form rather than a table. Information on the long-term sustained yield has been moved to Chapter IV. Information on timber utilization standards have been added in response to public concern.
Public Issues	- How much timber should be harvested? - How can timber sales be prepared to provide proper coordination with other resources? - Should sales, including timber salvage, be planned on uneconomical areas? - What degree of slash cleanup should be required after timber harvest? - What clearcutting, if any, should be allowed and how could clearcutting be coordinated with other uses? - How much and what kind of reforestation is appropriate? - Should permits be required for free firewood cutting and what controls should be established?
Comparison	The annual timber sale program is the amount of timber expected to be sold and harvested within the budget available. Table 2.8 and 2.9 display the timber program for the alternatives, minimal level benchmark, and maximum PNV benchmark.

Table 2.8 shows the annual timber sale program, both board feet and cubic feet are shown for 15 decades. The annual allowable timber sale quantity is shown in Table 2.3.

TABLE 2.8 ANNUAL TIMBER SALE PROGRAM BY TIME PERIOD

DECADE	MIN LEV	CURRENT PLAN	A-1	A-2	B-1	B-2	C	D
First								
Million Board Feet	0	13.0	20.0	20.0	14.0	14.0	12.5	12.5
Million Cubic Feet	0	3.8	5.9	5.9	4.1	4.1	3.7	3.7
Second								
Million Board Feet	0	13.0	30.0	30.0	18.2	18.2	12.5	12.5
Million Cubic Feet	0	3.8	8.8	8.8	5.4	5.4	3.7	3.7
Third								
Million Board Feet	0	13.0	34.0	34.0	20.3	20.3	12.5	12.5
Million Cubic Feet	0	3.8	10.0	10.0	6.0	6.0	3.7	3.7
Fourth								
Million Board Feet	0	13.0	37.0	37.0	21.8	21.8	12.5	12.5
Million Cubic Feet	0	3.8	10.9	10.9	6.4	6.4	3.7	3.7
Fifth								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7
Sixth								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7
Seventh								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7
Eighth								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7
Ninth								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7
Tenth								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7
Eleventh								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7
Twelfth								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7
Thirteenth								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7
Fourteenth								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7
Fifteenth								
Million Board Feet	0	13.0	41.0	41.0	23.7	23.7	12.5	12.5
Million Cubic Feet	0	3.8	12.1	12.1	7.0	7.0	3.7	3.7

TABLE 2.8 Continued ▭ Planned ▭ Proposed

E-1	E-2	F	(Depart) F	(Prefer) G	H	I	J	K	MAX PNV
14.0 4.1	14.0 4.1	14.0 4.1	15.5 4.6	14.0 4.1	14.7 4.3	13.0 3.8	13.0 3.8	12.4 3.6	24.0 7.1
17.0 5.0	17.0 5.0	17.0 5.0	20.1 5.9	17.0 5.0	16.6 4.9	17.0 5.0	17.0 5.0	12.4 3.6	31.2 9.2
22.8 6.7	22.8 6.7	20.0 5.9	27.1 8.0	20.0 5.9	18.6 5.5	20.0 5.9	20.0 5.9	12.4 3.6	40.5 11.9
28.2 8.3	28.2 8.3	23.0 6.8	28.1 8.3	20.0 5.9	20.5 6.0	22.0 6.5	22.0 6.5	12.4 3.6	52.7 15.5
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	20.0 5.9	22.4 6.6	22.0 6.5	22.0 6.5	12.4 3.6	69.5 20.4
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	22.0 6.5	22.4 6.6	22.0 6.5	22.0 6.5	12.4 3.6	89.1 26.2
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	22.0 6.5	22.4 6.6	22.0 6.5	22.0 6.5	17.0 5.0	84.0 24.7
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	22.0 6.5	22.4 6.6	22.0 6.5	22.0 6.5	17.0 5.0	67.0 19.7
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	22.0 6.5	22.4 6.6	22.0 6.5	22.0 6.5	17.0 5.0	53.7 15.8
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	22.0 6.5	22.4 6.6	22.0 6.5	22.0 6.5	17.0 5.0	42.8 12.6
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	22.0 6.5	22.4 6.6	22.0 6.5	22.0 6.5	17.0 5.0	34.3 10.1
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	22.0 6.5	22.4 6.6	22.0 6.5	22.0 6.5	17.0 5.0	27.5 8.1
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	22.0 6.5	22.4 6.6	22.0 6.5	22.0 6.5	17.0 5.0	27.5 8.1
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	22.0 6.5	22.4 6.6	22.0 6.5	22.0 6.5	17.0 5.0	22.1 6.5
33.1 9.7	34.0 10.1	24.0 7.1	26.6 7.8	22.0 6.5	22.4 6.6	22.0 6.5	22.0 6.5	17.0 5.0	17.7 5.2

Table 2.9 shows acres of precommercial thinning, commercial thinning, clearcut, shelterwood cut, overwood removal and selection cut for the first five decades.

TABLE 2.9

ANNUAL TIMBER ACTIVITY BY DECADE

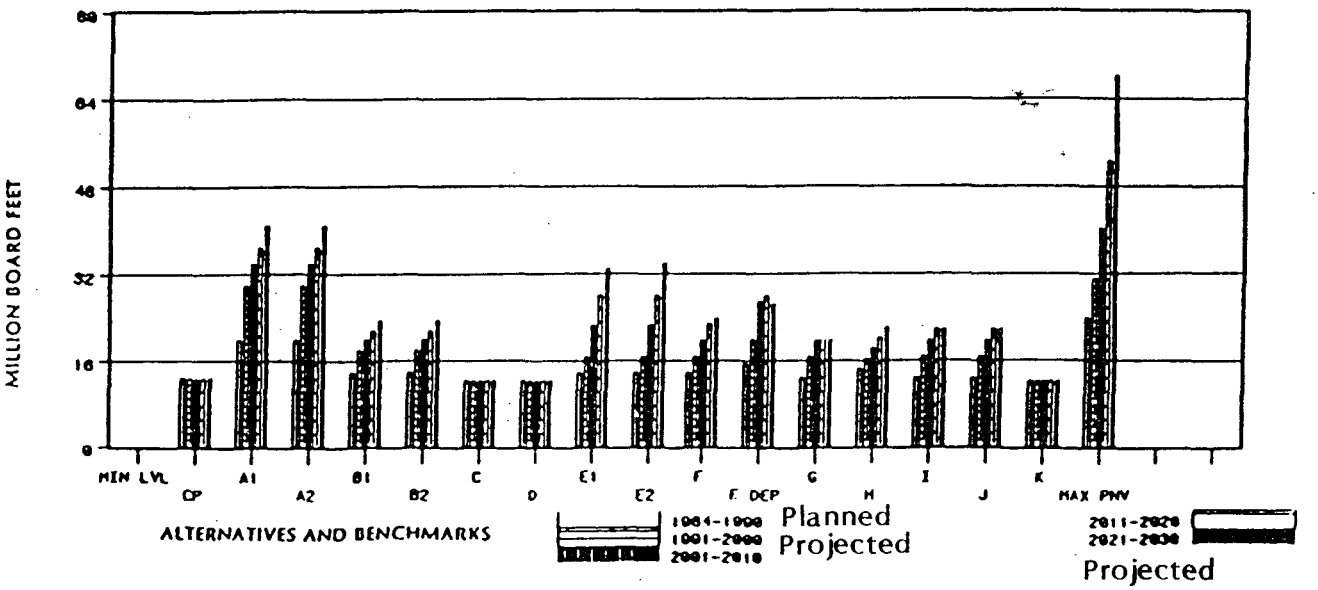
DECADE	MIN LEV	CURRENT PLAN	A-1	A-2	B-1	B-2	C	D	E-1
First									
Precomm. Thin-Ac.	0	165	1074	764	122	238	192	215	613
Commercial Thin-Ac.	0	100	100	100	100	100	100	100	100
Clearcut-Ac.	0	840	961	1002	728	849	756	806	685
Shelterwood Regen Cut-Ac.	0	571	1133	1314	803	843	677	718	835
Overwood Removal-Ac.	0	200	200	200	200	200	200	200	200
Selection-Ac.	0	0	1250	90	0	0	0	60	0
Second									
Precomm. Thin-Ac.	0	170	1454	1099	166	322	161	211	601
Commercial Thin-Ac.	0	100	100	100	100	100	100	100	100
Clearcut-Ac.	0	705	1522	1441	985	1191	635	791	855
Shelterwood Regen Cut-Ac.	0	478	1794	1887	1085	1182	569	705	1043
Overwood Removal-Ac.	0	300	300	300	300	300	300	300	300
Selection-Ac.	0	0	1250	90	0	0	0	60	0
Third									
Precomm. Thin-Ac.	0	211	1258	1191	138	175	97	137	151
Commercial Thin-Ac.	0	100	100	100	100	100	100	100	100
Clearcut-Ac.	0	554	1301	1538	932	1080	474	516	991
Shelterwood Regen. Cut-Ac.	0	376	1534	2016	1028	1072	424	460	1208
Overwood Removal-Ac.	0	571	1133	1314	803	843	677	718	835
Selection-Ac.	0	0	1250	90	0	0	0	60	0
Fourth									
Precomm. Thin-Ac.	0	177	2270	2250	409	672	110	409	672
Commercial Thin-Ac.	0	100	100	100	100	100	100	100	100
Clearcut-Ac.	0	737	1661	1772	1413	1469	758	590	1302
Shelterwood Regen Cut-Ac.	0	500	1958	2322	1556	1458	679	525	1586
Overwood Removal-Ac.	0	478	1794	1887	1085	1182	569	705	1043
Selection-Ac.	0	0	1250	90	0	0	0	60	0
Fifth									
Precomm. Thin-Ac.	0	140	2041	1614	176	522	372	81	522
Commercial Thin-Ac.	0	100	100	100	100	100	100	100	100
Clearcut-Ac.	0	731	1759	1790	1603	1430	731	620	1722
Shelterwood Regen Cut-Ac.	0	497	2074	2344	1766	1420	655	552	2097
Overwood Removal-Ac.	0	376	1534	2016	1028	1072	424	460	1208
Selection-Ac	0	0	1250	90	0	0	0	60	0

DECADE	E-2	F	(Depart) F	(Prefer) G	H	I	J	K	MAX PNV
First									
Precomm. Thin-Ac.	198	126	126	200	200	200	200	175	298
Commercial Thin-Ac.	100	100	100	100	100	100	100	100	100
Clearcut-Ac.	694	794	1177	631	643	629	631	605	1295
Shelterwood Regen Cut-Ac.	952	787	1083	836	852	834	836	802	1467
Overwood Removal-Ac.	200	200	200	200	200	200	200	200	200
Selection-Ac.	0	1930	1930	60	22	63	63	63	30
Second									
Precomm. Thin-Ac.	235	133	133	200	200	200	200	175	331
Commercial Thin-Ac.	100	100	100	100	100	100	100	100	100
Clearcut-Ac.	819	833	1348	603	612	604	603	416	1642
Shelterwood Regen Cut-Ac.	1124	827	1240	799	811	801	799	552	1860
Overwood Removal-Ac.	300	300	300	300	300	300	300	300	300
Selection-Ac.	0	1930	1930	60	22	63	63	63	30
Third									
Precomm. Thin-Ac.	148	130	186	220	224	219	220	211	414
Commercial Thin-Ac.	100	100	100	100	100	100	100	100	100
Clearcut-Ac.	1077	814	1075	752	677	750	743	459	2005
Shelterwood Regen. Cut-Ac.	1476	808	989	997	897	994	986	608	2271
Overwood Removal-Ac.	952	787	1083	836	852	834	836	802	1467
Selection-Ac.	0	1930	1930	60	22	63	63	63	30
Fourth									
Precomm. Thin-Ac.	237	196	306	210	213	211	210	145	525
Commercial Thin-Ac.	100	100	100	100	100	100	100	100	100
Clearcut-Ac.	1298	1230	1164	1041	764	1023	1040	574	3024
Shelterwood Regen Cut-Ac.	1779	1220	1071	1380	1012	1356	1378	761	3423
Overwood Removal-Ac.	1124	827	1240	799	811	801	799	552	1060
Selection-Ac.	0	1930	1930	60	22	63	63	63	30
Fifth									
Precomm. Thin-Ac.	780	184	234	260	236	262	259	160	641
Commercial Thin-Ac.	100	100	100	100	100	100	100	100	100
Clearcut-Ac.	1687	1157	1064	739	1072	655	641	386	3115
Shelterwood Regen Cut-Ac.	2311	1147	978	980	1421	869	849	512	3527
Overwood Removal-Ac.	1476	808	989	997	897	994	986	608	2271
Selection-Ac	0	1930	1930	60	22	63	63	63	30

These figures do not represent acreage targets by method for the alternatives. Rather, they are the levels projected by the Forest planning model that represent the optimal way of meeting the objectives and constraints of each alternative. Final determination of what silvicultural system will be used for a particular project will be made by a certified silviculturist after an on-the-ground site analysis.

Figure 2.12 displays the timber sale program by alternative, minimum level benchmark, and maximum PNV benchmark, for the first five decades.

FIGURE 2.12 TIMBER SALE PROGRAM



All Alternatives	Timber sale coordination with other resources would be the same under all alternatives. Slash cleanup, firewood cutting, and reforestation would be the same under all alternatives. The Forest would rely on natural regeneration for most reforestation. About 10 percent of the sites would have to be planted. Under all alternatives, clearcutting is used in conformance with NFMA regulations and the Northern Regional Guide. The amount of clearcutting varies by alternative (see Table 2.9).
Current Plan	Under current management, annual timber program would remain 13 million board feet (3.8 million cubic feet). The potential yield from the Forest, under current management, is 17.0 million board feet (see Chapter III, page 3-31). Sixty percent of roadless areas would be retained. Two percent of the steep, low productivity dry sites in the Jefferson Division would be harvested.

Alternative A-1	Under this alternative, 41 million board feet (12.1 million cubic feet) of timber would be offered for sale annually, by 2030. Thirty-one percent of roadless areas would be retained. The alternative would harvest 12,000 acres in riparian zones and 4,200 acres in rural recreation settings, on a regulated basis. Ninety-five percent of the steep, low productivity sites in the Jefferson Division would be harvested. MWSA areas would not be harvested.
Alternative A-2	Under this alternative, 41 million board feet (12.1 million cubic feet) of timber would be offered for sale annually, by 2030. This alternative would retain 12 percent of the roadless areas. No riparian zones or rural recreation settings would be harvested on a regulated basis. Ninety percent of the steep, low productivity sites in the Jefferson Division would be harvested. MWSA areas would be harvested.
Alternative B-1	Under this alternative, 23.7 million board feet (7.0 million cubic feet) of timber would be offered for sale annually, by 2030. This alternative would retain 37 percent of the roadless areas. It would not harvest timber in any riparian zones or rural recreation settings, on a regulated basis. It would harvest 70 percent of the steep, low productivity sites in the Jefferson Division. MWSA areas would not be harvested.
Alternative B-2	Under this alternative, 23.7 million board feet (7.0 million cubic feet) of timber would be offered for sale annually, by 2030. No timber would be harvested in riparian zones or rural recreation settings, on a regulated basis. Seventy percent of the steep, low productivity sites in the Jefferson Division would be harvested. Thirty-two percent of the roadless areas would be retained. MWSA areas would be harvested.
Alternative C	Under this alternative, 12.5 million board feet (3.7 million cubic feet) of timber would be offered for sale annually, by 2030. No timber in riparian zones or rural recreation settings would be harvested, on a regulated basis. Twenty-five percent of the steep, low productivity sites in the Jefferson Division would be harvested. Eighty percent of the roadless areas would be retained. MWSA areas would be harvested.

Alternative D	Under this alternative, 12.5 million board feet (3.7 million cubic feet) of timber would be offered for sale annually, by 2030. No timber would be harvested in riparian zones or rural recreation settings on a regulated basis. Five percent of the steep, low productivity sites in the Jefferson Division would be harvested. Seventy-four percent of the roadless areas would be retained. MWSA areas would be harvested.
Alternative E-1	Under this alternative, 33.1 million board feet (9.7 million cubic feet) of timber from the Jefferson Division would be offered for sale annually, by 2030. No timber would be harvested in riparian zones or rural recreation settings, on a regulated basis. Seventy percent of the steep, low productivity sites in the Jefferson Division would be harvested. Of the roadless areas, 53 percent would be retained. No regulated timber harvest would take place in the Rocky Mountain Division. MWSA areas would not be harvested.
Alternative E-2	Under this alternative, 34.0 million board feet (10.0 million cubic feet) of timber from the Jefferson Division would be offered for sale annually, by 2030. No timber would be harvested in riparian zones or rural recreation settings on a regulated basis. Ninety-eight percent of the steep, low productivity sites in the Jefferson Division would be harvested. Thirty-five percent of the roadless areas would be retained. No regulated timber harvest would take place in the Rocky Mountain Division. MWSA areas would be harvested.
Alternative F	Under this alternative, 24 million board feet (7.1 million cubic feet) of timber would be offered for sale annually, by 2030. Timber would be harvested on the most economical sites. This alternative would add 1,131 acres of commercial forest land in riparian zones and no acres of rural recreation setting to the regulated base. This alternative would maintain 78 percent of the roadless areas. Fifteen percent of the steep, low productivity sites in the Jefferson Division would be harvested. The upper part of the Middle Fork Judith MWSA area would be harvested.
Alternative F-Departure	Under this alternative, 26.6 million board feet (7.8 million cubic feet) of timber would be offered for sale annually, by 2030. The most economical sites would be harvested. This alternative would

add 1,131 acres of commercial forest land in riparian zones and no acres of rural recreation setting to the regulated base. This alternative would maintain 78 percent of the roadless areas. Seventeen percent of the steep, low productivity sites in the Jefferson Division would be harvested. The upper part of the Middle Fork Judith MWSA area would be harvested.

Alternative G-Preferred

Under this alternative, 20 million board feet* (5.9 million cubic feet) of timber would be offered for sale annually, by 2030. This alternative would add 746 acres of commercial forest land in riparian zones and no acres of rural recreation setting to the regulated base. This alternative would maintain 92 percent** of the roadless areas. Nine percent of the steep, low productivity sites in the Jefferson Division would be harvested.
* 22 million board feet DEIS-Supplement.
** 86 percent DEIS-Supplement.

Alternative H

Under this alternative, 22.4 million board feet (6.6 million cubic feet) of timber would be offered for sale annually, by 2030. This alternative would add 111 acres of commercial forest land in the riparian zone and 71 acres of rural recreation setting to the regulated base. This alternative would maintain 98 percent of the roadless areas. Sixteen percent of the steep, low productivity sites in the Jefferson Division would be harvested.

Alternative I

Under this alternative, 22 million board feet (6.5 million cubic feet) of timber would be offered for sale annually, by 2030. This alternative would add 310 acres of commercial forest land in riparian zones and no acres of rural recreation setting to the regulated base. This alternative would maintain 88 percent of the roadless areas. Nine percent of the steep, low productivity sites in the Jefferson Division would be harvested.

Alternative J

Under this alternative, 22 million board feet (6.5 million cubic feet) of timber would be offered for sale annually, by 2030. This alternative would add 310 acres of commercial forest land in the riparian zone and no acres of rural recreation setting to the regulated base. This alternative would maintain 85 percent of the roadless areas. Nine percent of the steep, low productivity sites in the Jefferson Division would be harvested.

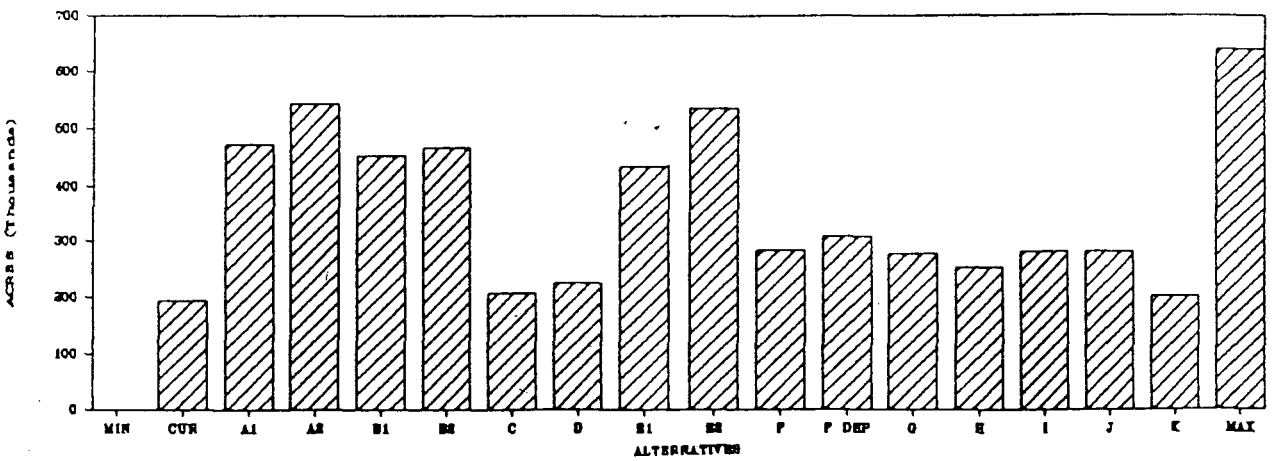
Alternative K

Under this alternative, 12.4 million board feet (3.6 million cubic feet) of timber would be offered for sale annually, by 2030. This alternative would add 310 acres of commercial forest land in riparian zones and no acres of rural recreation setting to the regulated base. This alternative would maintain 90 percent of the roadless areas. Three percent of the steep, low productivity sites in the Jefferson Division would be harvested.

Land Suitable for Timber Harvest

All lands managed by the Forest were tested for suitability for production of timber by applying the criteria discussed in Appendix B, Section II. Tentatively suitable timber lands (675,690 acres) were assigned prescriptions that meet the management objectives of a given alternative. High timber output alternatives have the most acreage assigned regulated timber prescriptions (Figure 2.13). As emphasis shifts from producing timber to maintaining roadless recreation, elk security areas and wilderness management, the acreage assigned regulated timber prescriptions decreases. Lands considered not appropriate for timber management may, in many cases, be used for firewood gathering and post and pole cutting.

FIGURE 2.13 SUITABLE TIMBERLAND



Timber Utilization Standards

All alternatives reflect revised utilization standards that were prescribed for use in the Northern Regional Guide. An analysis was conducted of the volume and economic value impacts of converting from the current utilization standards (FSM 2451.22, 3/83, R-1 Supplement 301) to those in the Northern Regional Guide. Table 2.10 shows a comparison of these standards.

TABLE 2.10 Comparison of Current vs Regional Guide Utilization Standards

Length Standard	Minimum D.B.H. Lodgepole Pine	Minimum D.B.H. All Other Species	Minimum top d.i.b. All Species	Minimum Piece All Species
Current	7"	8"	5.6"	8'
Proposed	6"	7"	4.6"	8'

To conduct the analysis, land use designations and constraints were made constant and timber yield tables were changed to reflect the different utilization standards. Table 2.11 shows the difference in timber volumes and present net value for the Maximum Present Net Value Benchmark and Preferred Alternative (G). Figure 2.14 displays these differences. Table 2.12 shows a comparison of volume by tree species and tree diameters.

TABLE 2.11
Comparison of timber volume and present net value between the current and Regional Guide utilization standards for the first decade.

Item	Current Standards	Proposed Standards	Difference	Percent Change
Max Present Net Value Benchmark:				
Million Cubic Feet	68.2	70.6	2.4	3.5%
Million Board Feet	231.9	240.0	8.1	3.5%
Present Net Value	23.5	24.3	0.8	3.3%
Preferred Alternative:				
Million Cubic Feet	34.2	35.6	1.4	4.0%
Million Board Feet	116.3	121.0	4.7	4.0%
Present Net Value	37.042	37.274	.231	0.62%

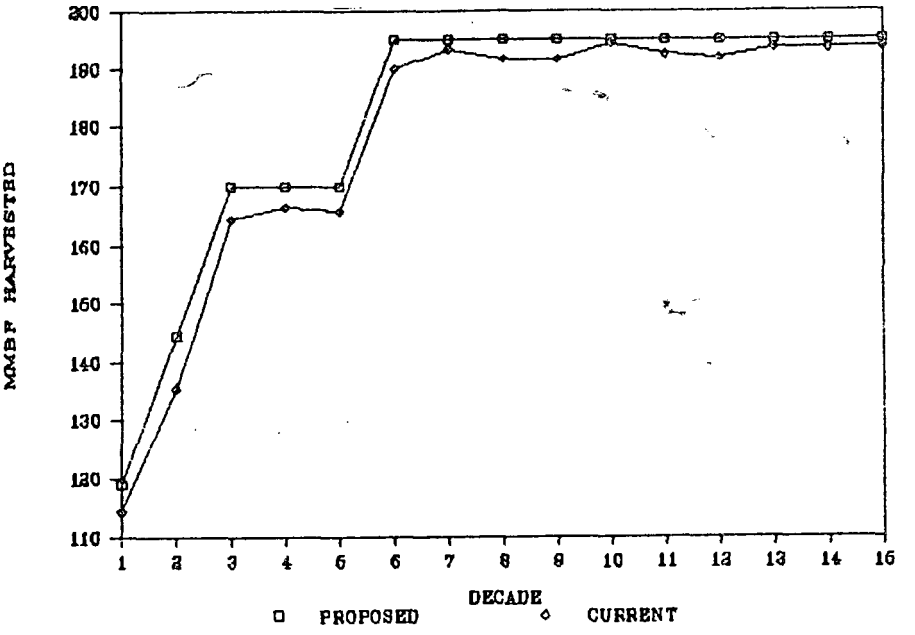
TABLE 2.12

Comparison of volume by tree species and tree diameters (MMBF and MMCF) between the current and Regional Guide utilization standards for the Preferred Alternative in the 1st and 5th decades.

Volume	Species			
	Lodgepole Pine	Douglas Fir	Ponderosa Pine	TOTAL
Current Standards				
1st Decade				
Million Board Feet	59.9	53.0	3.4	116.3
Million Cubic Feet	17.6	15.6	1.0	34.2
5th Decade				
Million Board Feet	63.6	96.9	9.5	170.0
Million Cubic Feet	18.7	28.5	2.8	50.0
Regional Guide Standards				
1st Decade				
Million Board Feet	62.6	54.1	4.3	121.0
Million Cubic Feet	18.4	15.9	1.3	35.6
5th Decade				
Million Board Feet	66.2	97.8	10.0	174.0
Million Cubic Feet	19.4	28.8	3.0	51.2

Volume	Diameter Class										
	7-7.9	8-8.9	9-9.9	10-10.9	11-11.9	12-12.9	13-13.9	14-14.9	15-15.9	16-16.9	TOTAL
Current Standards											
1st Decade											
Million Board Feet	5.1	58.5					0.7		50.7	1.3	116.3
Million Cubic Feet	1.5	17.2					0.2		14.9	0.4	34.2
5th Decade											
Million Board Feet		59.5	13.6						0.3	96.6	170.0
Million Cubic Feet		17.5	4.0						0.1	28.4	50.0
Regional Guide Standards											
1st Decade											
Million Board Feet	6.5	60.8					0.7		51.7	1.3	121.0
Million Cubic Feet	1.9	17.9					0.2		15.2	0.4	35.6
5th Decade											
Million Board Feet	61.9	14.6							0.3	97.2	174.0
Million Cubic Feet	18.2	4.3							0.1	28.6	51.2

FIGURE 2.14 COMPARISON OF CURRENT VS REGIONAL GUIDE UTILIZATION STANDARDS (Preferred Alternative)



Preferred Alternative	Converting from the current utilization standards to those in the Northern Regional Guide results in an increase in projected timber yield of 4.7 million board feet and an increase in PNV of .231 million dollars, for the first decade under the Preferred Alternative (G). The values represent increases of 4.0 percent and .62 percent respectively, from values obtained when using the current utilization standards.
Maximum Present Net Value Benchmark	Converting from the current utilization standards to those in the Northern Regional Guide results in an increase in a projected timber yield of 8.1 million board feet and an increase of .8 million dollars, for the first decade under the Maximum PNV Benchmark. These values represent increases of 3.5 percent and 3.3 percent respectively, from values obtained when using the current utilization standards.
Conclusion	The results of the comparison using Lewis and Clark National Forest timber and economic data indicate that changing back to the use of current utilization standards in Forest Plans would be economically disadvantageous to the United States Government. There would be a drop in both PNV and volume of timber offered.

SOILS	Approximately 370 acres need restoration to control management-caused erosion. Restoration is being done as funds are available.
Public Issue	- What measures are necessary to prevent or reduce erosion from: (a) road and trail maintenance; (b) off-road vehicle use; (c) timber sales; and (d) oil and gas exploration and development?
Change Between Draft and Final EIS	None.
All Alternatives	All restoration to control management-caused erosion would be completed by 1995. All reasonable land, soil, and water conservation practices, as guided by technical handbooks, to prevent any new management-caused erosion would be applied.

MINERALS-OIL AND GAS

As required by the Energy Security Act of 1980, the Forest established an oil and gas leasing program during the development of the Forest Plan. This program utilized analytical procedures developed during the Forest planning process while deferring surface use decision to the Forest Plan while fulfilling the requirements of the Act. Alternatives which are more restrictive towards oil and gas activity can only be implemented on new leases.

Changes Between Draft and Final EIS

A table showing how oil and gas potential would be affected by alternative by mineral potential class has been added in response to public concern.

Public Issues

- How much mineral exploration and development should be allowed?
- How should conflicts between exploration for and development of mineral resources and surface resource values be resolved?
- How can the Forest help achieve the national need for energy self-sufficiency through conservation of renewable and nonrenewable energy resources?

Comparison

Figure 2.15 displays how the oil and gas potential would be affected by alternative, minimum level benchmark, and maximum PNV benchmark.

FIGURE 2.15 EFFECT ON OIL AND GAS POTENTIAL

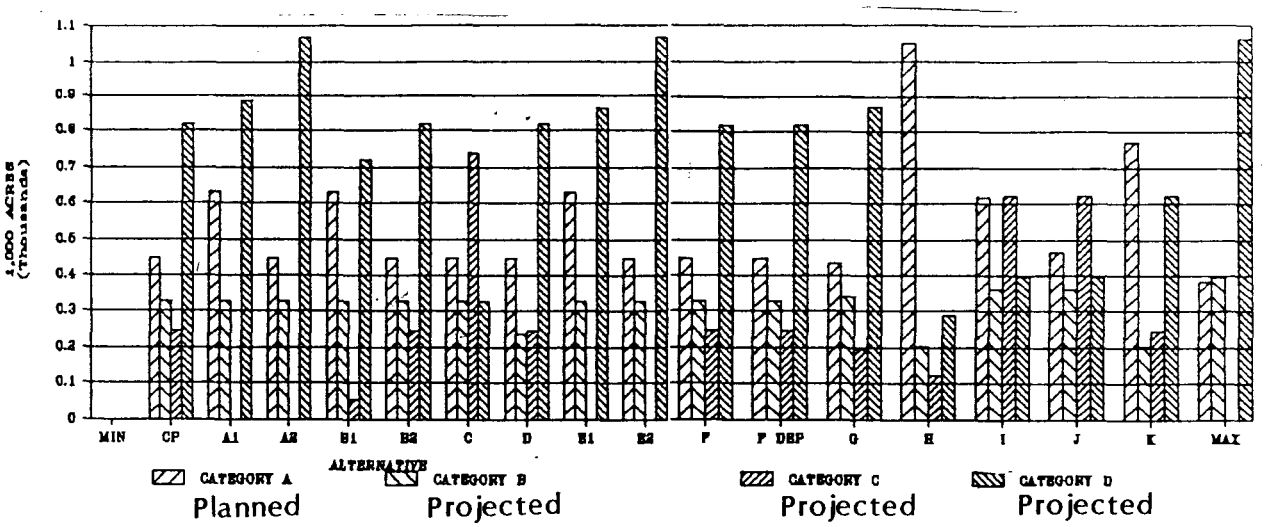


Table 2.13 shows how the oil and gas potential would be affected by alternative by mineral potential class. Category A lands are withdrawn or proposed for withdrawal for mineral entry. Category B lands are lands where laws or executive orders requiring specific protection or mitigation measures apply. Category C lands are lands where special mitigation measures are required by the Regional Forester. Category D lands are lands where standard lease stipulations apply.

TABLE 2.13 EFFECTS OF ALTERNATIVES ON OIL AND GAS POTENTIAL BY MINERAL POTENTIAL CLASS

Alternative	Category 1/	Very High	High	Mod	Low
Current Plan	A	448	0	0	0
	B	328	0	0	0
	C	0	0	55	193
	D	0	0	53	766
A-1	A	448	0	55	129
	B	328	0	0	0
	C	0	0	0	0
	D	0	0	53	830
A-2	A	448	0	0	0
	B	328	0	0	0
	C	0	0	0	0
	D	0	0	108	959
B-1	A	448	0	55	129
	B	328	0	0	0
	C	0	0	14	146
	D	0	0	39	684
B-2	A	448	0	0	0
	B	328	0	0	0
	C	0	0	55	193
	D	0	0	53	766
C	A	448	0	0	0
	B	328	0	0	0
	C	0	0	80	658
	D	0	0	37	292
D	A	448	0	0	0
	B	328	0	0	0
	C	0	0	55	193
	D	0	0	53	766
E-1	A	448	0	55	129
	B	328	0	0	0
	C	0	0	0	0
	D	0	0	54	829
E-2	A	448	0	0	0
	B	328	0	0	0
	C	0	0	0	0
	D	0	0	109	958
F	A	448	0	0	0
	B	328	0	0	0
	C	0	0	55	193
	D	0	0	53	766
F-Departure	A	448	0	0	0
	B	328	0	0	0
	C	0	0	55	193
	D	0	0	53	766
G-Preferred	A	436	0	0	0
	B	340	0	0	0
	C	0	0	55	142
	D	0	0	53	817
H	A	573	0	80	395
	B	203	0	0	0
	C	0	0	4	118
	D	0	0	20	270
I	A	531	0	0	89
	B	245	0	0	0
	C	0	0	70	510
	D	0	0	37	361
J	A	413	0	0	50
	B	363	0	0	0
	C	0	0	74	549
	D	0	0	33	361
K	A	573	0	15	183
	B	203	0	0	0
	C	0	0	41	206
	D	0	0	50	572

1/ Category A - lands withdrawn or proposed for withdrawal for mineral entry
Category B - lands where laws or executive orders require specific protection or mitigation measures apply.
Category C - lands where special mitigation measures are required by the Regional Forester.
Category D - lands where standard lease stipulations apply.

All Alternatives	New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA, tiering to this EIS through incorporation by reference the information presented in this EIS. Special stipulations are used whenever the leased area has surface resource values needing special protection to meet the alternative management objectives. Lands within the Bob Marshall and Scapegoat Wildernesses were withdrawn from leasing by the Wilderness Act of 1964 as of December 31, 1983.
Current Program	Existing oil and gas leases have been processed under the guidelines of the "Environmental Assessment on Oil and Gas Leasing on Nonwilderness Land" which is incorporated by reference to this EIS This alternative allows that occupancy leasing be recommended for areas that can be adequately protected during oil and gas activity. Lease denial or issuance of a no-surface occupancy lease is recommended when an application is entirely within an area that could not be adequately protected. Leases partially in sensitive areas that cannot be protected receive a no-surface occupancy stipulation for those sensitive areas. Timing restrictions, limited surface use, and the activity coordination stipulations are used to protect recreation, soil, water, and wildlife.
Alternative A	Leasing recommendations would be similar to the current program. A recommendation to deny leases would be made where physical limitations prevented occupancy. Normally drilling requires construction of roads to access drill sites. The construction of roads, depending on location, will effect the character of roadless areas and displace wildlife species under this alternative. Large amounts of oil and gas could be discovered, resulting in increases in employment, revenues, and royality returns to Federal and State Government.
Alternatives B, F, F-Departure, G-Preferred, H, I, and J	Leasing recommendations would be similar to the current program. Timing restrictions and limited surface occupancy will be used to minimize effects on wildlife. Access roads for drilling will effect the character of roadless areas. Abandoned well sites and roads will be closed and natural vegetatic restored. Oil and gas leases in areas recommended for wilderness classification would not be issued. Large amounts of oil and gas could be discovered, resulting in increases in employment, revenues, and royality returns to Federal and State Government.
Alternatives C, D, and K	Leasing recommendations would be similar to the current program. Oil and gas leases in areas

recommended for wilderness classification would not be reissued. Less opportunity exists for the development of oil and gas.

Alternative E

Leasing recommendations would continue as under the current plan on the Rocky Mountain Division. On the Jefferson Division, only standard stipulations would be used to protect surface values.

MINERALS-METALLICS AND OTHER MINERALS

Metallics

A moderate level of exploration exists on the Forest. This includes geologic mapping and sampling. Development work in the Barker-Hughesville area on patented and individual claims is taking place. Presently, the Forest receives approximately 15 operating plans per year, mostly from small operators. Although the number of operating plans may increase in the future, production would probably not increase significantly. Production would probably come from established mining areas, such as the Barker-Hughesville area.

Change Between Draft and Final EIS

A table showing how metallics and other minerals would be affected by alternative by mineral potential class has been added.

Public Issues

- How much mineral exploration and development should be allowed?
- How should conflicts between exploration for and development of mineral resources and surface resource values be resolved?

All Alternatives

Mineral development is governed by mining laws and regulations. Those alternatives with the most roads would provide the greatest opportunity for mineral exploration and most help national needs for mineral self-sufficiency.

Lands within the Bob Marshall and Scapegoat Wildernesses were withdrawn from mineral entry by the Wilderness Act of 1964 as of December 31, 1983. There are no existing mining claims on wilderness lands on the Lewis and Clark National Forest.

Conflicts between exploration and non-mineral resources would be treated equally under all alternatives.

Only high value surface uses and improvements would be protected through mineral withdrawal.

Comparison

Figure 2.16 displays how metallics and other minerals would be affected by alternatives, minimum level benchmark, and maximum PNV benchmark. Table 2.14 shows how metallics and other minerals would be affected by alternative by mineral potential class.

FIGURE 2.16 EFFECTS ON METALLICS AND OTHER MINERALS

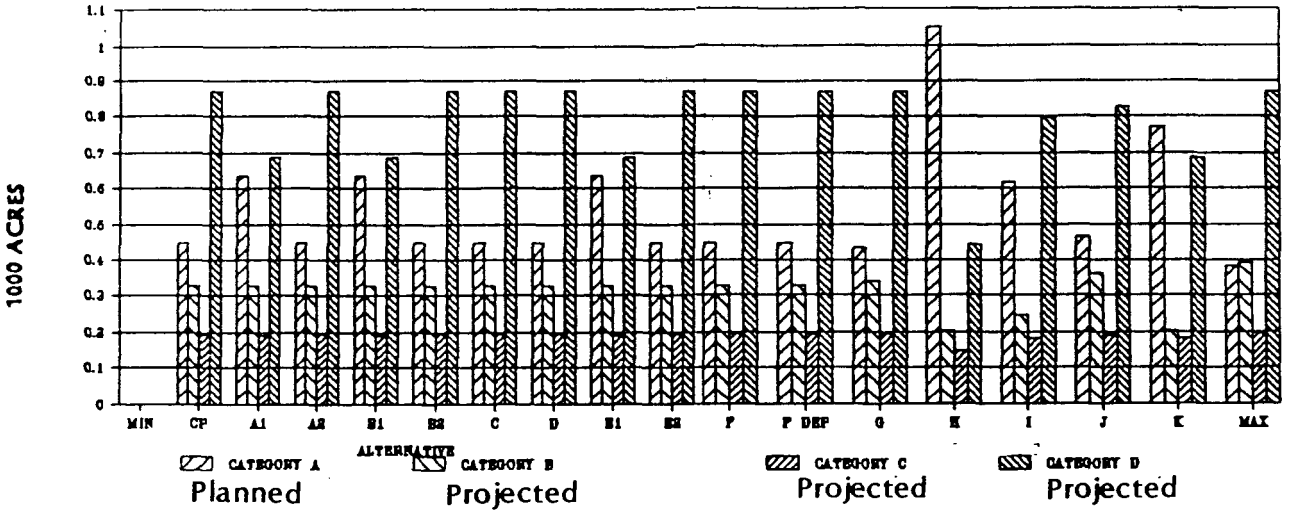


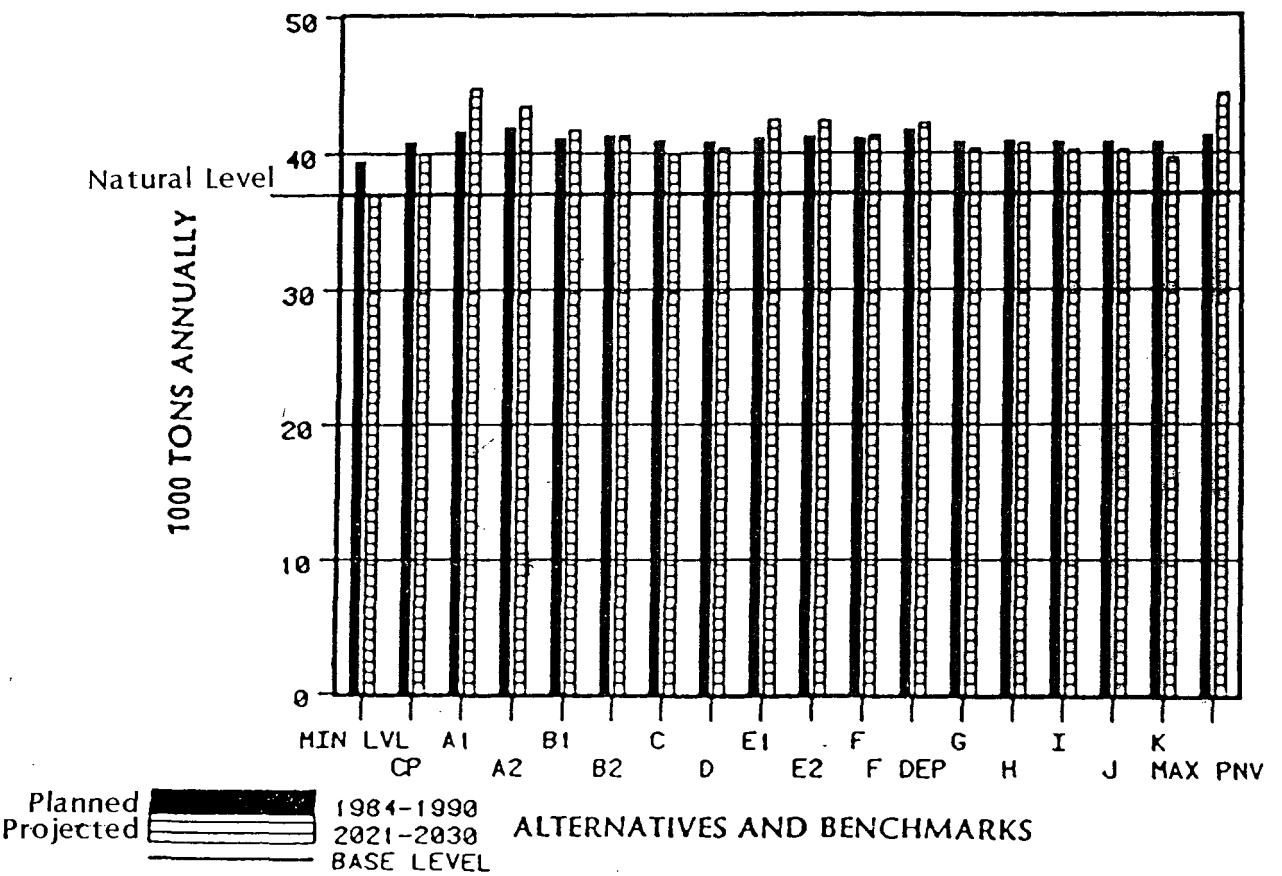
TABLE 2.14 LOCATABLE MINERAL AND LEASABLE ENERGY POTENTIAL
Potential for Hard Rock Minerals

Alternative	Category	Very High	High	Mod	Low
Current Plan	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
A-1	A	0	0	7	630
	B	0	0	0	328
	C	0	0	30	160
	D	5	30	128	525
A-2	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
B-1	A	0	0	7	630
	B	0	0	0	328
	C	0	0	30	160
	D	5	30	128	525
B-2	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
C	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
D	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
E-1	A	0	0	7	630
	B	0	0	0	328
	C	0	0	30	160
	D	5	30	128	525
E-2	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
F	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
F-Departure	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
G-Preferred	A	0	0	0	436
	B	0	0	0	340
	C	0	0	32	165
	D	5	30	130	705
H	A	0	0	122	927
	B	0	0	0	203
	C	0	0	6	142
	D	5	30	32	376
I	A	0	0	0	619
	B	0	0	0	245
	C	0	0	32	151
	D	5	30	130	631
J	A	0	0	0	463
	B	0	0	0	362
	C	0	0	32	158
	D	5	30	130	663
K	A	0	0	0	772
	B	0	0	0	203
	C	0	0	32	150
	D	5	30	130	521
MIN LEVEL	A	0	0	0	0
	B	0	0	0	0
	C	0	0	0	0
	D	0	0	0	0
MAX LEVEL	A	0	0	0	384
	B	0	0	0	392
	C	0	0	32	165
	D	5	30	130	705

WATER	Average annual water yield from National Forest land is approximately 1,700,000 acre feet, of which 1,698,000 acre feet meets State standards. About 37,000 tons of sediment are produced by natural erosion annually. Sediment production can be generated both by increased water yields and ground disturbance. The principal activity resulting in increased water yields from Lewis and Clark National Forest lands are road construction and timber harvest. Other activities that contribute to increased water yield are clearing associated with road construction, mineral exploration and development, grazing, and slash disposal and site preparation following timber harvest. Ground disturbance increases the risk of increased sediment yields. Ground-disturbing activities include road construction, mineral exploration and development, timber harvest and the associated slash disposal and site preparation, and grazing, especially in riparian zones. The actual risk of increased sediment yield will vary depending on the amount of soil disturbance, the type of treatment, soil material, and various other physical and biological factors. As areas stabilize and disturbed sites revegetate, sediment production decreases. For example, during and immediately after road construction, the potential for sediment increases substantially over background levels. As the roadbeds settle and stabilize in the decade following construction, sediment risk is much less, but still remains somewhat above background sediment values of a previously unroaded drainage.
Changes Between Draft and Final EIS	None.
Public Issue	- What coordination is necessary between water and other resources to protect watershed values and water quality? - What measures are necessary to prevent or reduce erosion from: road and trail maintenance, off road vehicle use, timber sales, and oil and gas exploration and development?

All Alternatives	Management practices will be used in all alternatives to carry out these activities to assure that they will accomplish Forest Plan goals, one of which is to meet and/or exceed State water quality standards. These practices are referred to as best management practices. Due to their higher sediment production potentials, it would be more costly to meet Forest water quality goals for Alternatives A-1, A-2, E-1, E-2, and there would be a greater risk that water quality might be impacted in spite of application of best management practices. The effects of sediment production on water related beneficial uses will be evaluated during project development to ensure meeting Forest water quality goals. Projects that will not meet State water quality standards will be redesigned, rescheduled, or dropped.
Comparison	Figure 2.17 shows the projected sediment yields for the alternatives, minimum level benchmark, and maximum PNV benchmark. These values are for comparison purposes and are not absolute measurements.

FIGURE 2.17 SEDIMENT YIELD



Current Program	Under current management, the entire annual water yield would meet quality standards by the year 2000. RPA requires elimination of any existing management-caused erosion by that time.
Alternatives A,B,E,F, F-Departure ,G-Preferred, H, I, and J	Under these alternatives, there would be slight (up to 20,000 acre feet) increases in water yield by 2030, due to management practices. Sediment yield would increase (up to 4,200 tons) over natural levels due to increased activities disturbing the soil, although all reasonable conservation practices would be applied.
Alternative C, D, and K	Under these alternatives, current situation would not change.

HUMAN AND COMMUNITY DEVELOPMENT	The Forest is involved in two categories of Human Resource Programs, sponsored and hosted programs. Sponsored progams are funded by Congress appropriated money. Hosted programs include enrollees under other agencies and volunteers in National Forest.
Changes Between Draft and Final EIS	None.
	The Blackfeet Indian Nation retains certain use rights on the northern part of the Rocky Mountain District. See Chapter III, page 3-4.
Management Concern	- How do rights accorded to the Blackfeet Indian Tribe in the agreement modified by Congress in 1896 affect management of National Forest land in that agreement?
All Alternatives	The Forest offers opportunities for equal participation of women and minorities in Forest programs and activities under all alternatives.
	The Forest has established a working group with representatives of the Blackfeet Tribe and Bureau of Indian Affairs to define and resolve resource and legal issues on Blackfeet Indian Treaty Agreement lands.
	Forest Human Resource Programs opportunities would be the same under any alternative.

LANDS	On the Lewis and Clark National Forest, the lands function is divided into five subparts: land adjustment, land uses, rights-of-way, land status, and land line location.
Changes Between Draft and Final EIS	None.
Management Concern	- What landownership adjustment would support resource management goals and when should the Forest place its priorities in an adjustment program?
All Alternatives	The size of the lands program reflects the amount of resource activity proposed by each alternative. Under all alternatives, the Forest seeks land ownership adjustments to support long-term goals and objectives. The land acquisition program would be the same under any alternative.

FACILITIES-ROADS AND TRAILS	The current inventoried road system has 155 miles of arterial roads, 643 miles of collector roads, and 597 miles of local roads. There are approximately 600 miles of uninventoried primitive roads. The current trails system is 1,677 miles.
Changes Between Draft and Final EIS	Alternative G (Preferred) has been modified slightly in response to public concern.
Public Issues	- What is adequate access to and within the National Forest? - What roads should be maintained and to what extent? - Should additional trail be provided?
Comparison	Roads needed for surface resource management by the alternatives, the minimum level benchmark, and the maximum PNV benchmark are shown on Figures 2.18 and 2.19. Additional roads could be needed for subsurface resource uses such as oil and gas exploration and development activities.

FIGURE 2.18 ARTERIAL AND COLLECTOR ROADS

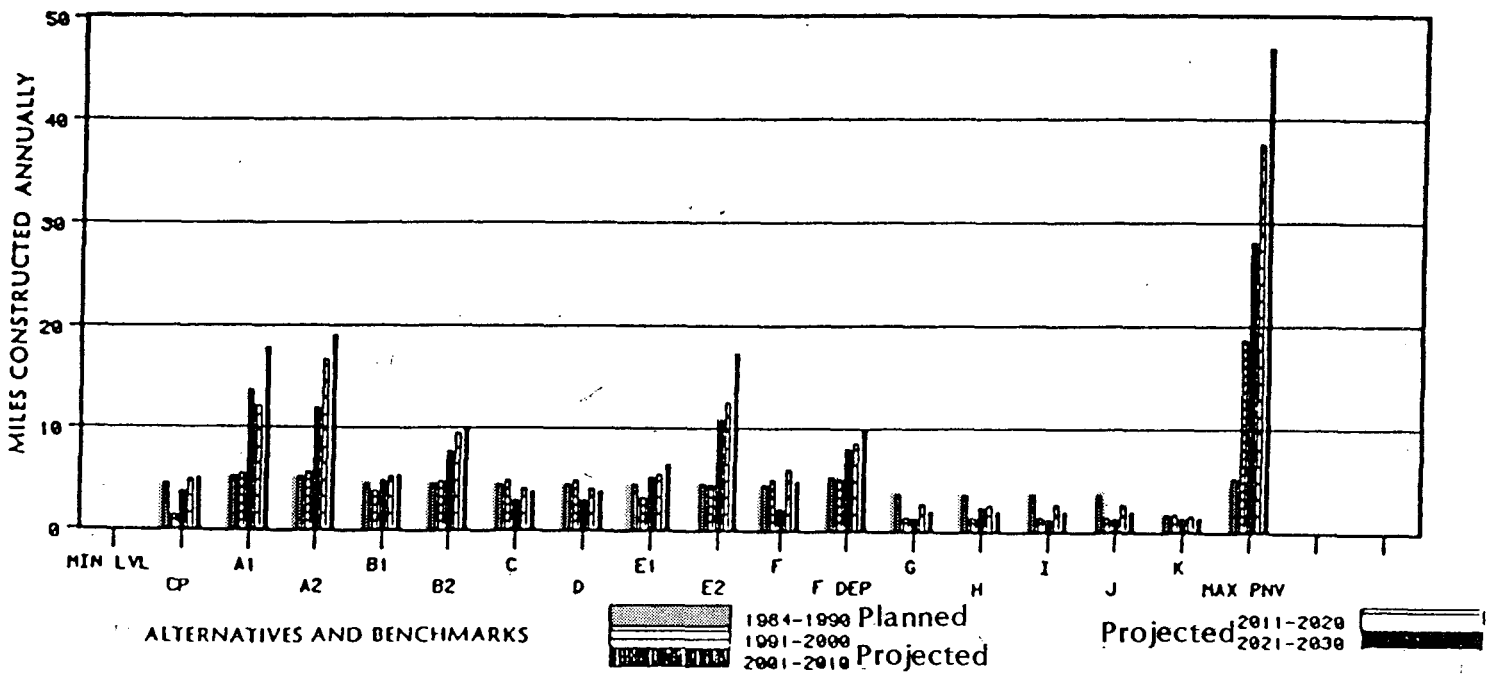
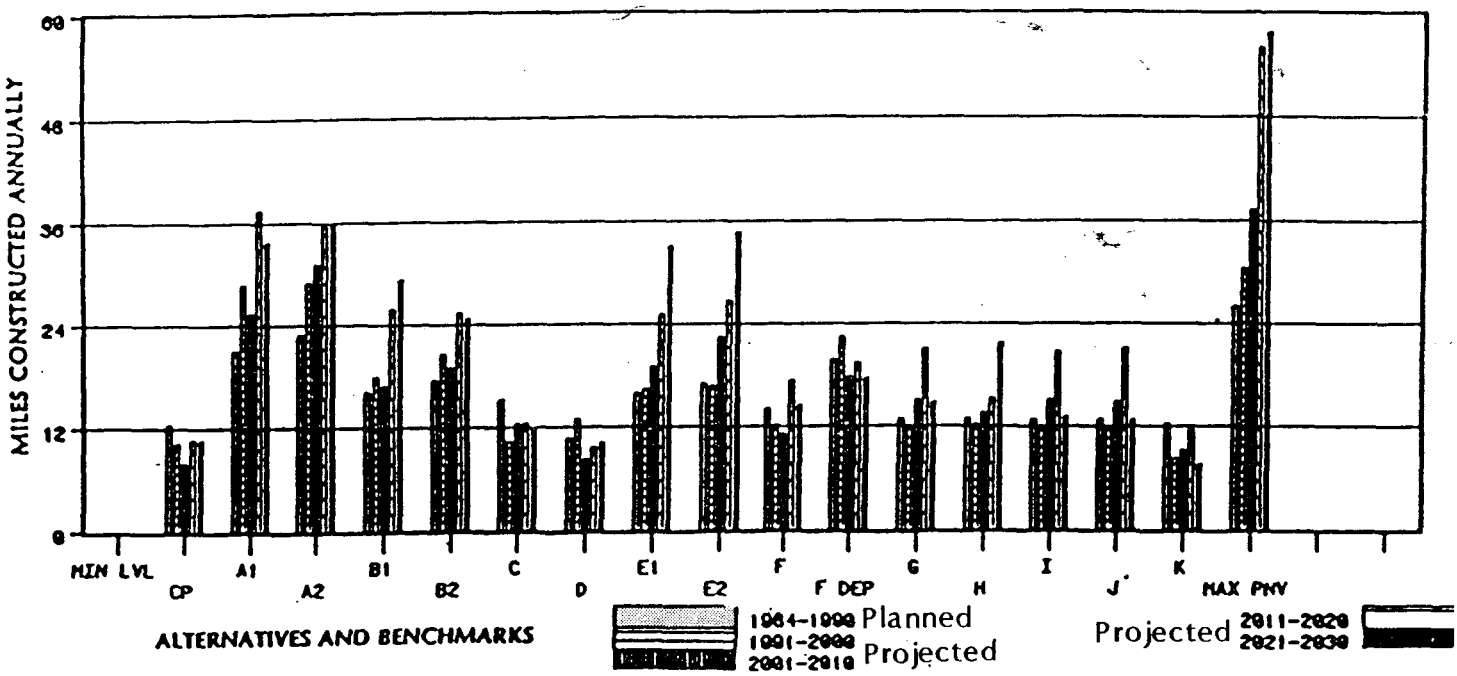


FIGURE 2.19 LOCAL ROADS FIGURE



All Alternatives	Road management would be the same for all alternatives. Road closures and/or restrictions would be used for public safety, resource protection, and reducing user conflicts. A major road management objective would be providing wildlife security. Road maintenance and road signing are governed by the road standard, use level, and condition [Forest Service Handbooks 7109.11 (Signs), 7709.11 (Road Standards), 7709.15 (Maintenance)].
Current Plan	Under the current management plan, by 2030 an additional 198 miles of arterial and collector roads and 523 miles of local roads would be constructed. About 99 miles of rights-of-way across private land would be required. The amount of trails would decrease, as presently unroaded areas become roaded. No new trails would be planned.

Alternative A-1	Under this alternative, by 2030 an additional 545 miles of arterial and collector roads and 1,466 miles of local roads would be constructed. About 199 miles of rights-of-way across private land would be required. Many trails would be replaced with roads. About 20 miles of trails would be constructed or reconstructed per decade. These trails would generally be in classified wilderness.
Alternative A-2	Under this alternative, by 2030 an additional 587 miles of arterial and collector roads and 1,548 miles of local roads would be constructed. About 199 miles of rights-of-way across private lands would be required. Many trails would be replaced with roads. About 15 miles of trails would be constructed or reconstructed per decade. These trails would generally be in classified wilderness.
Alternative B-1	Under this alternative, by 2030 an additional 240 miles of arterial and collector roads and 1,064 miles of local roads would be constructed. About 183 miles of rights-of-way across private land would be required. Many trails would be replaced by roads. About 8 miles of trails would be constructed or reconstructed annually. These trails would generally be in classified wilderness.
Alternative B-2	Under this alternative, by 2030 an additional 367 miles of arterial and collector roads and 1,075 miles of local roads would be constructed. About 183 miles of rights-of-way across private land would be required. Many trails would be replaced by roads. No trails would be constructed or reconstructed.
Alternative C	Under this alternative, by 2030 an additional 203 miles of arterial and collector roads and 627 miles of local roads would be constructed. About 168 miles of rights-of-way across private land would be required. Some trails would be replaced by roads. About 20 miles of trails would be constructed per decade. These trails would be in undeveloped lands and classified wilderness.
Alternative D	Under this alternative, by 2030 an additional 203 miles of arterial and collector roads and 520 miles of local roads would be constructed. About 148 miles of rights-of-way across private land would be required. About 20 miles of trails would be constructed or reconstructed per decade. These trails would be in undeveloped lands and classified wilderness.

Alternative E-1	Under this alternative, by 2030 an additional 249 miles of arterial and collector roads and 1,100 miles of local roads would be constructed in the Jefferson Division. About 169 miles of rights-of-way across private land would be required. Most trails in the Jefferson Division would be replaced by roads. About 20 miles of trails would be constructed or reconstructed per decade. Most of these trails would be classified wilderness and other areas of the Rocky Mountain Division.
Alternative E-2	Under this alternative, by 2030 an additional 500 miles of arterial and collector roads and 1,181 miles of local roads would be constructed on the Jefferson Division. About 169 miles of rights-of-way across private land would be required. Most trails in the Jefferson Division would be replaced by roads. About 18 miles of trails in the Rocky Mountain Division would be constructed or reconstructed per decade.
Alternative F	Under this alternative, by 2030 an additional 225 miles of arterial and collector roads and 698 miles of local roads would be constructed. About 70 miles of rights-of-way across private land would be required. Some trails would be replaced by roads. About 20 miles of trail would be constructed or reconstructed per decade. These trails would be in undeveloped lands and classified wilderness.
Alternative F-Departure	Under this alternative, by 2030 an additional 371 miles of arterial and collector roads and 975 miles of local roads would be constructed. About 76 miles of rights-of-way across private land would be required. Some trails would be replaced by roads. About 20 miles of trails would be constructed or reconstructed per decade. These trails would be in undeveloped lands and classified wilderness.
Alternative G-Preferred	Under this alternative, by 2030 an additional 121 miles of arterial and collector roads and 762 miles* of local roads would be constructed. About 70 miles of rights-of-way across private land would be required. Some trails would be replaced by roads. About 100** miles of trails would be constructed or reconstructed per decade. These trails would be in undeveloped lands and classified wilderness. * 763 miles local roads DEIS-Supplement. ** 50 miles of trail DEIS-Supplement.

Alternative H	Under this alternative, by 2030 an additional 120 miles of arterial and collector roads and 762 miles of local roads would be constructed. About 70 miles of rights-of-way across private land would be required. About 50 miles of trails would be constructed or reconstructed per decade. These trails would be in classified wilderness.
Alternatives I and J	Under these alternatives, by 2030 an additional 110 miles of arterial and collector roads and 740 miles of local roads would be constructed. About 70 miles of rights-of-way across private land would be required. Some trails would be replaced by roads. About 50 miles of trails would be constructed or reconstructed per decade. These trails would be in undeveloped lands and classified wilderness.
Alternative K	Under this alternative, by 2030 an additional 79 miles of arterial and collector roads and 495 miles of local roads would be constructed. About 64 miles of rights-of-way across private land would be required. Some trails would be replaced by roads. About 20 miles of trails would be constructed or reconstructed per decade. These trails would be in undeveloped lands and classified wilderness.

PROTECTION-FIRE MANAGEMENT

The Forest currently operates under a 1972 Fire Plan. However, funding has not been sufficient to fully implement this plan.

Changes Between Draft and Final EIS

None.

Public Issue

- How much, if any, prescribed burning should be planned?

Comparison

Table 2.15 displays acres of prescribed fire by alternatives, minimum level benchmark, and maximum, PNV benchmark.

TABLE 2.15 PRESCRIBED FIRE

Alternative	Natural Fuel (Acres/Year)	Activity Fuel (Acres/Year)	Total Planned (Acres/Year)
Minimum Level	0	0	0
Current Plan	1573 1/	1393	2966
A-1	3148	3143	6291
A-2	3268	3294	6562
B-1	1905	2367	4272
B-2	1967	2382	4349
C	1979	1497	3476
D	2481	1300	3781
E-1	2765	2503	5268
E-2	2623	2672	5295
F	2279	2230	4509
F(Departure)	2293	2033	4326
G(Preferred)	2037	1750	3787
H	942	1753	2695
I	2028	1703	3731
J	2026	1701	3727
K	1672	1135	2807
Maximum PNV	1569	4276	5845

1/ This annual acreage is the potential under current direction. Actual annual accomplishment has averaged about 200 acres/year.

All Alternatives

A Fire Management Plan for the Scapegoat Wilderness and Danaher portion of the Bob Marshall Wilderness was implemented in 1981. A Fire Management Plan for the remainder of the Bob Marshall Wilderness was implemented in 1983. These Plans specify the conditions when fire is permitted to play a more natural role in the wilderness.

Alternatives with the most prescribed fire have the greatest potential of reducing wildfire. Potential wildfire is reduced by breaking up large, decadent lodgepole pine stands, through timber harvest and subsequent slash disposal. Also, underburning in certain ponderosa pine and Douglas fir types reduces accumulation of hazardous fuels.

PROTECTION-INSECT AND DISEASE	Four types of insects and two diseases are the most damaging agents to the Forest's trees. Increased management will generally reduce the insect and disease hazard potential. Such management activities include timber harvest, thinning, hazard tree removal, use of chemicals, and prescribed burning. On the Lewis and Clark the major concern is the mountain pine beetle, which effects lodgepole pine. Beetle populations periodically increase and kill most large diameter trees in a forest before subsiding. The Forest has about 200,000 acres of lodgepole pine that is classified as highly susceptible to mountain pine beetle attacks and 87,000 acres of moderate risk (Gibson and Dooling, 1983). The spruce bark beetle and Douglas fir bark beetle attack stands that are disturbed by blowdown, logging, or fire. Western spruce budworm has caused defoliation of nearly 88,000 acres of Douglas fir on the Forest and adjacent lands. Thirty-six percent of the commercial lodgepole pine is infested with dwarf mistletoe. Root disease occurs extensively in Douglas fir and lodgepole pine.
Changes Between Draft and Final EIS	None.
Public Issue	- To what extent and in what manner should insect and disease control be carried out?
All Alternatives	All alternatives would emphasize removing lodgepole pine stands with high risk for mountain pine beetle attack. Alternatives which harvest the most timber would have the greatest potential to reduce the loss because more acres are in a variety of age classes. Under Alternatives A-1, A-2, B-1, B-2, C, D, E-1, E-2, H, and K about 50 percent of the scheduled timber harvset would be in lodgepole pine stands. Under Alternatives F, F-Departure, G (Preferred), I, and J, 70 percent of the scheduled timber harvest would be in lodgepole.

ECONOMIC COMPARISON

Management Concern

Consider the need to provide goods and services efficiently.

Changes Between Draft and Final EIS

The discussion on net public benefits and nonpriced benefits has been expanded.

Cost and benefits are displayed by resource element.

A discussion and table on indicators of responsiveness of alternative to major issues and concerns has been added.

Other economic tables have been revised to conform to regional and national direction.

The discussion on economic tradeoffs has been expanded.

Some of the process type information has been moved to Appendix B.

Community Effects

Changes in the timber sale program, livestock grazing, recreational use, and Forest Service expenditures result in employment and personal income in 13 central Montana counties. Within the 13 county areas, Forest activities in 1980 accounted for $12.73 million in personal income and 946 private sector jobs. (See Appendix B, section V, and tables B-3 and B-4.) This accounts for 2 percent of the personal income of $531 million and 2 percent of the total employment of 51,567 jobs within the 13 county area. (Note: Both Great Falls and Helena are within this area).

Figures 2.20 and 2.21 display employment and income changes from the current plan in the first and fifth decades. Differences among alternatives in employment and income are primarily due to changes in the timber sale program, grazing levels, and recreation emphases and in all secondary sectors such as retail trade and services. Projections were made with an input/output model. The employment and income analysis is described in the planning record, "Input/Output Model."

The employment and income value include, indirect and induced effects. The change in first decade forest related employment varies from 0 to 30 percent, though most of the alternatives have a change of from +4 to +13 percent.

Total employment and income increase after the first decade and in this way contribute more or less to the economic growth and development of the communities in all alternatives, except C and K which have the lowest range and timber levels.

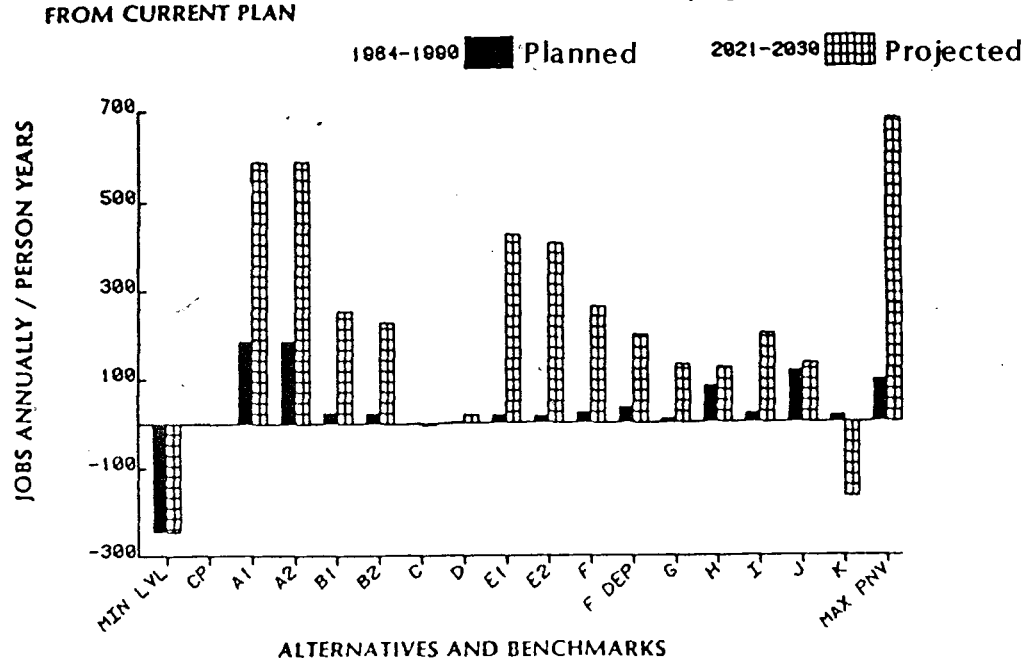
Little negative population impact is projected in any of the alternatives because of the low existing population densities and the small rate of projected population growth. (See Chapter IV, Table 4.36.)

Market - oriented alternatives usually contain expanded employment and high income levels in wood products, ranching, and minerals but reduced employment for guides, outfitters and recreational businesses, though this increase is slight since even in the market oriented alternatives the recreation capacity of the Forest is great enough to meet most demands. Income levels tend to decrease in low market alternatives since income levels for most recreation oriented jobs are lower than for other industry-based jobs.

Oil and gas exploration and development could cause additional changes in employment and income under all alternatives. The magnitude and effects of these changes are discussed in Chapter 4.

EMPLOYMENT CHANGES
FROM CURRENT PLAN

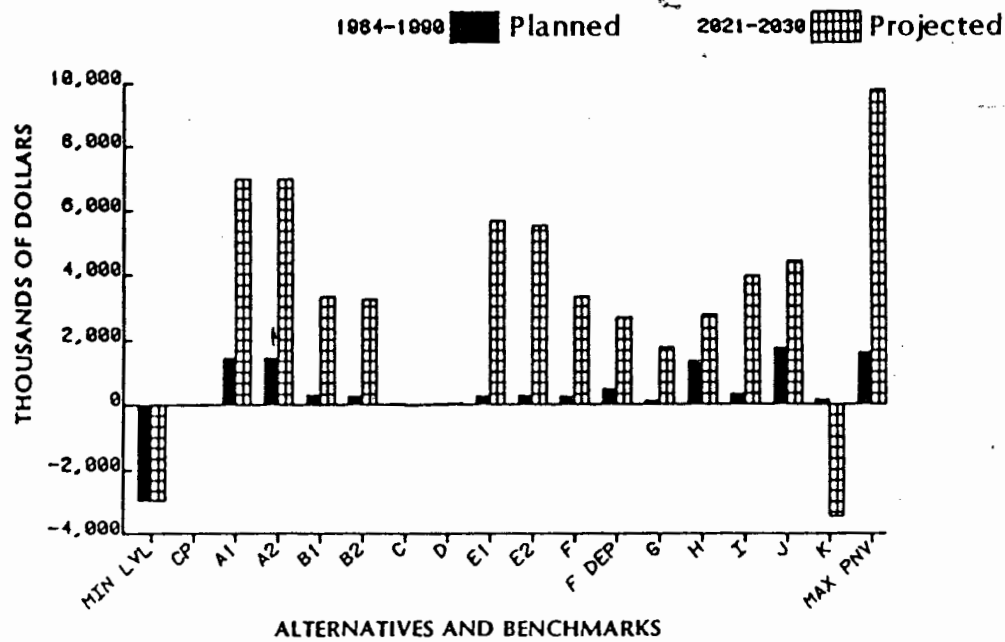
FIGURE 2.20



Alternatives A-1, A-2, E-1, and E-2 provide the greatest increase in job opportunity. (+70 percent by the fifth decade.) This increase would take place in the wood products industry. Alternatives B-1, B-2, F, F (Departure), G (Preferred), H, I, and J provide moderate increases in job opportunity, also in the wood processing industry. Alternatives C, D, and K would not significantly affect job opportunity.

INCOME CHANGES
FROM CURRENT PLAN

FIGURE 2.21



Income changes follow the same patterns as found for employment changes except for Alternative K. Again, Alternatives A-1, A-2, E-1, and E-2 provide the greatest increases in income opportunity. Alternatives B-1, B-2, F, F Departure, G-Preferred, H, I, and J provide moderate increases in income opportunity and Alternatives C and D produce essentially no change. Alternative K however, would produce an income loss approximately 10 percent below the current income due to reduced levels of timber harvest, livestock production, and the limited amount of increase in wilderness recreation opportunities.

Additional discussions on social, community, and economic impacts and analysis may be found in Chapter IV (see Social/Economic Consequences) and Appendix R (see Sections IV and V).

Social Effects in Central Montana

While the level of employment and income are important in the quality of life, it does not give the entire picture of the economic and social well being of local communities. In the small cities and rural areas of the west, an important part of peoples' total income comes not only from jobs and wages but from nonmarket goods and services that flow from the natural and social environment (Power, 1983). Five social traits--(1) control/self-sufficiency, (2) lifestyles and job dependence, (3) population and crowding, (4) community cohesion, and (5) land-ownership patterns are used to compare the effects generated by Forest outputs and activities (see Chapters III and IV). Descriptions are provided below of the interests and related ways of life of different groups of the dependent community and regional and national interests and how they may be influenced by the various alternatives. Comparisons are made to the Current Plan.

(1) Control/self-sufficiency. Plentiful supplies of wood and forage create a feeling of self-sufficiency for people dependent upon those resources for a livelihood. This is a trait common to many people of the 13-central Montana counties. As these market supplies decrease in Alternatives C, D, and K, so does the sense of control. Self-sufficiency decreases and uncertainity about the future increases for these people.

Some residents take it for granted that all Forest uses can be satisfied, despite ever increasing demands on the resource base. These people's sense of personal satisfaction, control and self-sufficiency could decrease if the timber harvest was increased to a level that significantly impacts other resources as in Alternative A-2, B-2, E-2, and F-Departure.

People who do not work in timber related jobs but reside in timber dependent communities could be adversely affected by alternatives that significantly decrease the timber output level. Their employment may be indirectly related to the timber harvest, or they are concerned about the stability of their community.

Residents not living in communities significantly tied to the timber industry, and individuals placing high value on conserving the natural resources provided by the Forest would more likely have a positive sense of well being and certainty about the future with Alternatives C, D, H, and K that have less emphasis on commodity outputs, provide protection of the resources and offer more varied recreation experiences.

Alternatives that are more balanced in providing market and nonmarket resources (F, G-(Preferred), I, and J) increase the feeling of certainty in both commodity and nonmarket oriented individuals in being able to live a desired way.

Regional people, mostly from eastern and western Montana seem to be more interested in the recreation opportunities provided by the Forest. They are most likely to favor alternatives which would protect the natural environment and provide a diversity of recreation opportunities. National interests are served in different ways. Alternatives which emphasize timber production over other values would benefit wood product consumers. Alternatives which stress wilderness, roadless and wildlife values over timber production often benefit environmental interests and consumers. As the timber sale program is lowered among alternatives, the net revenues to the Treasury are reduced.

(2) Lifestyles. Several groups of people are identified as those most likely to be affected by different Forest management programs. Natives and long-term residents of central Montana are accustomed to using the Forest for both commodity production and recreation opportunities. Some depend directly or indirectly on a healthy timber and grazing industry. Alternatives which would provide less timber even in the short run could be a concern to people in these communities. (Current Plan and Alternatives C, D, and K). Counties such as Meagher, Wheatland, and Park rely on the timber industry but have other resource revenue producing industries (i.e., farming and ranching) that contribute to their economies. Alternatives which stress timber management and reduce big-game populations and recreation however, would also concern people and affect their accustomed lifestyles (such as Alternatives A, B, and E).

Local people are accustomed to accessing the Forest for many of their needs; firewood, game, fish, and recreation. All alternatives include a restrictive road use in order to protect T&E species and elk habitat. Some people may be concerned about this restriction on traditional Forest access. Residents who would like to see little or no change from the current management direction would probably prefer Alternatives C and K.

Native Americans, of Glacier and Pondera Counties are often interested in both the amenity resources and economic opportunities provided by the Forest.

Many of the city dwellers from Great Falls, Helena, and Billings are not dependent on the forest products industry or grazing industry. Many live in central Montana for the natural environment; they would likely prefer alternatives that stress non-market values such as wildlife, recreation, visual resources, and wilderness.

The Rocky Mountain Division is recognized nationally for its outstanding wilderness, wildland, and wildlife values. Most regional and national public are opposed to any development, especially oil and gas development. Local residents tend to favor light commodity use, while protecting other values.

Alternatives that provide a resource mix--moderate to high levels of all resource concerns--would benefit most groups of people with little negative impact on any one specific group. Alternatives in this category include E-2, F, F-Departure, G-(Preferred), and J.

(3) Population and Crowding. Little negative population impact is projected in any of the alternatives because of the low existing population densities and the small rate of projected population growth.

In Alternatives A-1, A-2, B-1, B-2, E-1, E-2, F, F (Departure), G (Preferred), H, I, and J which result in increased populations, newcomers' lifestyle values would not differ from those values that presently exist. Alternative A-1, A-2, E-1, and E-2 would have population increases which may effect small communities that would process the increased wood products from these alternatives.

(4) Community Cohesion. Community cohesion includes the degree of unity and cooperation within a community, ability of residents to cope with change, and the degree to which lifestyles and values of residents are compatible. This is especially true in the White Sulphur Springs, Monarch-Neihart and rural areas.

A certain amount of conflict is inherent in implementing any alternative that is a change from the current situation. Alternatives A, B, E, F-Departure, H, I, and J have the greatest potential for disagreement between groups because they would likely be perceived as favoring one interest group to the detriment of another. However, most changes would be gradual due to budget limitations and conflict would be minimized. Some issues such as wilderness, which has become a major issue in Montana is a major source of disagreement.

(5) Landuse Patterns. This factor assesses the compatibility of proposed changes in land uses such as timber, wildlife habitat, recreation, and grazing with present uses and how the uses affect the social and economic life of communities, especially White Sulphur Springs and Monarch-Neihart. Forest Service actions would not significantly affect county land use patterns, however, changes in Forest land use could impact community social and economic factors.

All alternatives would increase the number of acres managed for timber. Alternatives C, D, and K would have small increases. Alternatives A-1, B-1, E-1, H, I, J, and K include an increase in acres proposed for wilderness over the Current Plan. Alternative G (Preferred) proposes less and Alternatives A-2, B-2, C, D, E-2, F, and F-Departure propose the same amount of wilderness as the Current Plan. Alternatives C, D, F, F-Departure, G (Preferred), H, I, J, and K include more areas for roadless recreation while Alternatives A, B, and E would have few areas set aside for roadless recreation. All alternatives include the same amount of habitat protection for T&E species. Alternatives C, H, and K increase habitat to support elk populations. Alternatives G (Preferred), I, and J would provide habitat for the current population potential. Alternatives A, B, D, E, F, and F-Departure would not provide habitat to support the current herd.

Net Public Benefit and Non-Priced Benefits

The overall conceptual measure of value of each of the alternatives is net public benefit. Net public benefit is summarized here as a preface to discussing those benefits that cannot be expressed in economic terms.

Net public benefit is the overall long-term value to the nation of all outputs and positive effects (called benefits) less all associated Forest inputs and negative effects (called costs) resulting from management of the Lewis and Clark Forest. These costs and benefits are expressed in priced (PNV) or non-priced terms (often subjectively measured). Many priced benefits and all financial costs of management can be measured in dollar terms. However, non-priced benefits and some negative effects cannot be measured quantitatively or cannot be fully valued in financial terms (See Appendix B, Section IV.) A major goal of forest planning is to provide information that helps determine which alternative provides the mix of resources and use that most closely responds to issues, concerns, and opportunities while maximizing the net public benefit of managing the Forest.

Net public benefit is maximized by the alternative which has the greatest excess of benefits over costs. The choice of the alternative that maximizes net public benefit is a subjective decision.

The principal benefits and costs relevant to making that decision for the Lewis and Clark National Forest are associated with the issues discussed in Appendix A and with legislation underlying the planning process. The benefits and costs are discussed below in the following sequence. First, those benefits that cannot be quantified (non-priced benefits) are discussed. Next, the discussion details those costs and benefits that can be measured in financial terms (significant differences in economic values among alternatives). Third, information is provided that describes the trade-offs between non-priced and priced benefits (major trade-offs among alternatives). Finally, there is a comparison of changes in economic benefits with differences in responses to the issues (economic trade-offs). Because these are summary statements, a fully informed judgement of the alternatives also requires an understanding of the results displayed elsewhere in this document.

The major non-priced benefits, described in detail in Appendix B, are summarized here. Non-priced benefits reflect issues that are not directly addressed by the alternative PNV comparisons. The resolution of these issues varies significantly by alternative and can be measured by physical indicators such as acres. Table 2.3 shows tradeoffs between providing priced outputs and non-priced outputs. The indicators are used to estimate the relative achievement of non-priced resource goals among alternatives. The indicators do not fully quantify or place a value on the non-priced benefits but they indicate differences in levels of non-priced benefits between alternatives.

Non-Priced Benefits

There are several non-priced benefits resulting from Forest management. Following are the nine non-priced benefits which were considered in this analysis.

1. Elk Hunting Quality -- The quality of elk hunting varies by alternative. Currently elk hunting quality indicators include the length of the hunting season and the animal's population structure. Both quality indicators are influenced by timber harvest and road construction. Timber harvesting on hiding cover areas would have varying impacts on hunting quality. Elk hunting quality was evaluated as a non-priced benefit to give consideration to the added value of having the opportunity to hunt in an undisturbed environment.

The priced benefit of an average quality elk hunter RVD used in our analysis does not adequately reflect above average elk hunting quality and the value of having a diversity of hunting opportunities, settings, and experiences. Each alternative was examined to determine its impact on elk hunting quality.

2. Semi-Primitive Recreation Setting -- According to public involvement comments, the maintenance of a semi-primitive recreation setting, in certain parts of the Forest, is important. Both semi-primitive motorized and non-motorized recreation was considered. Areas with well established semi-primitive use patterns are highly valued. Areas of prime interest include: Tenderfoot-Deep Creek-Pilgrim Creek, Middle Fork-Lost Fork of the Judith, Big Snowies, and Badger-Two Medicine. While RVDs are a priced component and are included in the PNV calculation, the

recreation setting has non-priced benefits. The assigned value per RVD does not reflect the value of providing a diversity of recreation opportunities and settings. The Lewis and Clark currently provides adequate recreation diversity but must specifically manage for a semi-primitive recreation setting to retain that type of recreation opportunity and to provide a diversity of opportunities in the future.

Indicators of semi-primitive recreation setting are the number of acres retained in that recreation opportunity setting.

3. Threatened and Endangered Species Habitat -- Habitat for these legislatively protected species is provided in all alternatives. The value of maintaining or restoring viable populations of T&E species is not included in PNV. Each alternatives' impact on T&E species habitat is evaluated. Habitat was evaluated in terms of how much land would be roaded on the Rocky Mountain Division.

4. Plant Diversity -- The value of maintaining long-term plant diversity is a non-priced component of net public benefits. Diversity is reflected in management for visual quality, water quality, T&E species, the regulated forest, recreation and wildlife habitat management, preservation of natural areas, and wilderness and roadless areas. Scientific research opportunities, gene pool maintenance, wildlife habitat, and reduced insect and disease risk are some of the reasons plant diversity is worth examining. Plant diversity, as discussed here, refers to horizontal diversity (e.g. the acres that are contained in old growth, post and poles, seedling-sapling stage, and in the grass forb stage). The indicator used to describe plant diversity is the amount of acreage in the various age class groups.

Timber harvesting is the primary method of vegetative manipulation, except in classified wilderness and wilderness study areas.

5. Visual Quality -- Visual quality refers to the range and distribution of the scenic aspects and perceived beauty and enjoyment of the forest environment. Differences among forest recreationists, nearby residents, and travelers in the enjoyment they would receive from the physical

conditions of each alternative are real but difficult to measure. While the total number of recreationists preferring conditions having particular scenic qualities and the implied dollar-values of their activities have been estimated, the options available to them would vary by alternative. Wildlife and water quality are also influenced by visual management activities resulting in additional nonpriced benefits.

Visual quality constraints have been included in the FORPLAN analysis and result in a reduced PNV. The PNV reduction results from timber and roading trade-offs to protect visual quality (a non-priced output).

Acres of preservation retention and partial retention of visual quality define the number of acres that will be maintained in a natural appearing state.

6. Minerals/Oil and Gas -- The Forest has a high, but unknown value for potential mineral, oil, and gas resources. The availability for exploration and development was considered for each alternative in the evaluation of net public benefit. The acreages available for oil and gas and mineral development by category are indicators of mineral and oil and gas availability.

7. Post, Poles and Firewood -- The opportunities for local people, ranchers, and small businesses to cut posts, poles, and firewood are not valued in the PNV.

The acreage available for timber management activities and the level of timber harvest are both indicators of the opportunities for post, pole, and firewood cutting.

8. Off-Forest Water Use -- Over 300,000 acres of private land depend on the Forest as a source of irrigation water. Clean water is also important to downstream fisheries. This value is not included in PNV but is considered as a non-priced benefit. The quantity and quality of water varies by alternatives.

Indicators of water quantity and quality are acre feet of water and tons of sediment produced.

9. Community Well Being and Human and Community Development Programs -- Most communities desire modest economic growth that can be managed without significant social disruptions or stresses on existing institutions. Changes in employment and income, and payments to counties are indicators of the economic aspect of community well being. These indicators generally decrease or increase in union with changes in priced benefits (primarily timber).

Another important indicator of community well being that cannot be quantified here (non-priced) is the social effects resulting from each alternative.

Human and Community Development Programs were also considered to have non-priced benefits, though they did not vary significantly between alternatives. The outputs produced through these programs are generally priced and included in the PNV calculation. However, the training provided to program enrollees and the benefits to community participants are largely non-priced components of net public benefit. Indicators of these benefits were number of participants and enrollee-years.

Significant Differences in Economic Values Among Alternatives

This section explains differences that occur among the alternatives priced benefits and outputs. Additional tradeoffs involving outputs and benefits not quantified in economic terms by PNV together with community effects and different responses to Forest issues are explained in the tradeoffs among alternatives section.

Difference in Present Net Value

The primary measure of economic efficiency (net priced benefits) is present net value (PNV). This is the sum of market and nonmarket priced values (timber sales, livestock grazing permits, recreation use, mineral leases, land use, power, special use, range and recreation collections) less all management costs of the 150-year planning horizon discounted at 4 percent. The maximum PNV Benchmark represents the maximum net return available from managing the Forest. Although it meets minimum legal requirements of managing the Forest, the PNV Benchmark is not designed to address issues.

The alternatives are ranked by present net value in Table 2.16. The second column in the table shows the differences in PNV among pairs of alternatives. These figures are estimates of the net economic values that would be foregone if a lower-ranked alternative rather than the preceeding one were

selected. Because timber values are the major component of PNV, these potentially foregone values are largely due to limiting the timber program. Also displayed in the table are discounted costs and benefits, and the differences in these values among pairs of alternatives.

TABLE 2.16 PRESENT NET VALUE, DISCOUNTED COSTS AND BENEFITS (Million $)

Alternative/Benchmark	PNV	Change	Discounted Costs	Change	Discounted Benefits	Change
MAX PNV (Benchmark)	308.01		560.17		868.18	
Alternative A1	280.89	-27.12	400.94	-159.23	681.83	-186.35
Alternative E1	262.41	-18.48	311.69	- 89.25	574.10	-107.73
Alternative A2	256.80	- 5.61	446.10	134.41	702.90	128.80
Alternative B1	242.61	-14.19	301.82	-144.28	544.43	-158.47
Alternative E2	242.48	- 0.13	350.92	49.10	593.40	48.97
Alternative B2	235.20	- 7.28	315.10	- 35.82	550.30	- 43.10
Alternative F (Dept.)	229.60	- 5.60	329.78	14.68	559.38	9.08
Alternative H	224.48	- 5.12	266.33	- 63.45	490.81	- 68.57
Alternative F	223.04	- 1.44	305.41	39.08	528.45	37.64
Alternative I	219.37	- 3.67	260.26	- 45.15	479.63	- 48.82
Alternative J	218.86	- 0.51	259.98	- 0.28	478.84	- 0.79
Alternative G (Prop.)	215.77	- 3.09	260.04	0.06	475.80	- 3.04
Alternative K	200.14	-15.63	208.27	- 51.77	408.41	- 67.39
Alternative D	184.47	-15.67	219.77	11.50	404.24	- 4.17
Current Plan	182.62	- 1.85	199.68	- 20.09	382.30	- 21.94
Alternative C	180.30	- 2.32	212.90	13.22	393.20	10.90

Discounted benefits and costs by resource group are displayed in Table 2.17. This table shows that timber values make up the majority of the PNV values on the Lewis and Clark National Forest. PNV declines because some cost-efficient timber sales are foregone; timber benefits decline more than increases in priced recreation and hunting benefits. This is because timber has higher priced benefits than the other resources and management for some non-timber resources do not provide priced benefits. To a lesser extent, changes in PNV are due to changes in benefits and costs for recreation and livestock grazing.

TABLE 2.17 DISCOUNTED BENEFITS AND COSTS BY RESOURCE GROUPS (Million Dollars)

		Discounted Benefits						Discounted Costs				
Alternatives/ Benchmarks	Present Net Value	Timber	Rec.	O&G	Hunting	Range	Other	Timber	Roads	Range	Wildlife	Other
MAX PNV	308.01	672.73	137.70	.85	48.10	8.13	1.51	409.85	30.12	6.78	0.35	113.07
A1	280.89	448.57	149.40	.85	60.40	22.22	1.24	284.90	15.35	12.81	5.25	82.62
E1	262.41	340.18	148.50	.85	62.40	21.71	1.31	117.30	6.96	11.94	3.15	172.35
A2	256.80	484.05	137.10	.85	58.00	22.35	1.40	300.54	15.20	12.87	5.76	111.72
B1	242.61	308.43	148.20	.85	65.20	21.79	0.81	189.97	6.90	11.65	1.81	91.50
E2	242.48	374.58	136.20	.85	59.90	22.43	0.29	236.04	13.34	11.92	3.22	86.40
B2	235.20	328.53	135.50	.85	63.70	21.91	0.66	199.48	9.48	11.56	1.88	92.70
F (Departure)	229.60	307.36	135.90	.85	60.70	21.07	34.34	199.23	14.75	21.59	3.02	91.20
H	224.48	244.89	143.40	.85	71.90	18.43	12.19	160.54	3.42	8.45	2.08	91.84
F	223.04	238.83	135.60	.85	68.20	21.02	64.80	174.04	4.54	21.69	3.04	102.10
I	219.37	233.52	136.80	.85	72.70	19.82	16.76	152.10	3.46	9.48	3.03	92.19
J	218.86	233.66	135.70	.85	72.70	19.82	16.96	152.81	3.46	9.49	3.01	91.21
G (Preferred)	215.77	230.75	135.00	.85	72.70	20.30	17.05	165.80	3.46	10.21	3.05	77.52
K	200.14	163.65	138.30	.85	71.10	19.93	15.43	163.63	3.26	9.08	3.72	28.59
D	184.47	174.73	135.20	.85	70.80	12.39	11.13	109.59	5.80	12.04	1.91	90.43
Current Plan	182.62	156.05	134.50	.85	70.60	20.52	0.63	100.60	5.33	10.53	1.95	81.28
C	180.30	165.55	134.90	.85	71.10	20.30	1.34	105.15	5.80	10.90	5.70	85.35

NOTE: The direct comparison of benefits and costs by individual resource can be misleading because all costs include nonseparable multi-resource management costs.

Below Cost Sales

The discounted timber benefits for the planning horizon are greater than the discounted timber costs (Table 2.17) which means that overall financial returns of the timber program is positive. However, the positive values do not mean that below costs sales have been avoided. Timber sales, whether below cost or not, were assessed in terms of how they fit into a comprehensive program of management for the Forest. The mix of outputs and associated costs and benefits produced by the different alternatives are the result of selecting prescriptions which most efficiently meet the objectives of the alternative. Cost efficiency was considered in (1) the development of the prescrip-

tions (see Appendix B, Section III and IV) and (2) the FORPLAN model had a range of those prescriptions to choose from when determining an optimal solution for each alternative based on the objective of maximizing PNV. The timber harvest level in all alternatives is less than the timber harvest level in the maximum PNV benchmark which represents the most economically efficient mix of management prescriptions and resource outputs for the Forest.

In spite of alternative and prescription cost efficiency objectives, indications, as in Table 2.18, are that below cost sales will ocur. When examining decade 1 alone, the overall net receipts (includes other resource programs besides timber) are negative for all alternatives and the Max PNV benchmark. By decade 5, the net receipts are positive for all alternatives. Sales with high investment costs in the immediate future are followed by sales in the future that have lower costs and higher returns so that the entire set of management activities provide a positive return. As pointed out by a research study on below costs, efficient managment and below cost sales are not incompatible (Schuster and Jones 1985).

In implementing any alternative, however, further project level analysis will be required prior to implementing that activity. Regional Office direction requires that as part of the project level analysis of each timber sale over one million board feet will be made to assure it has been designed with the most cost-effective measures possible in keeping with environmental concerns. This feasibility analysis will examine strategic items in the sale design process to assure consideration of economic impacts of these items on the sale value. Requirements of this analysis have been added to the final Forest Plan.

Receipts and Non-Cash Benefits

The portion of the economic benefits which are actual returns to the U.S. Treasury are called receipts. Receipts are projected to increase in all alternatives because of real stumpage price increases through the fifth decade and because the timber harvest level increases, in many alternatives, through the fifth decade. Net receipts increase more rapidly than costs in each decade for all alternatives. Receipts for decades 1 and 5 are shown in Table 2.18. Receipts are also displayed in Figure 2.22 for decades 1, 3, and 5. The annual returns by resource for decades 1 and 5 are listed in Table 2.3.

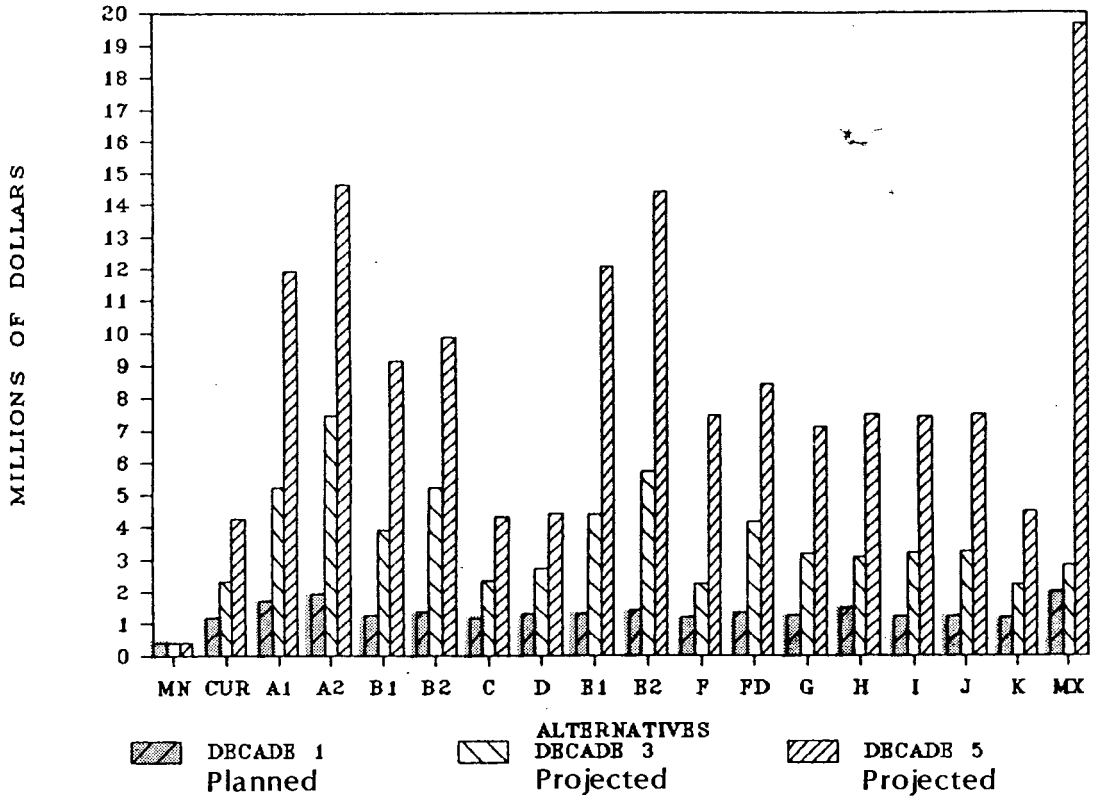
Non-cash benefits refer to the benefits individual resource users receive who are charged less for the resource than they are willing to pay. They are the difference between the full economic value of the resource and the fees actually paid to use that resource. Non-cash benefits are measured as total benefits less the value of receipts. They vary between alternatives from 77.7 percent to 93.7 percent of the total benefits for decade 1. Non-cash benefits for decades 1 and 5 are also shown in Table 2.18.

TABLE 2.18 AVERAGE ANNUAL RECEIPTS AND NON-CASH BENEFITS BY DECADE (Million Dollars)

	Planned Decade 1				Projected Decade 5			
Alternative	Net	Costs	Receipts	Non-Cash Benefits	Net	Costs	Receipts	Non-Cash Benefits
MAX PNV	-0.94	4.49	3.55	12.33	17.35	8.62	25.97	38.51
A-2	-1.77	4.82	3.05	11.20	9.95	7.42	17.37	26.41
B-2	-1.95	4.16	2.21	9.81	6.43	5.24	11.67	19.81
D	-1.96	4.07	2.11	9.52	0.54	4.71	5.25	14.70
Current Plan	-2.01	3.89	1.88	9.38	0.96	4.03	4.99	14.40
H	-2.01	4.14	2.13	10.66	3.70	5.25	8.95	18.77
E-2	-2.02	4.23	2.21	9.77	9.43	6.49	15.92	23.72
B-1	-2.09	4.10	2.01	10.04	6.17	5.00	11.17	20.20
E-1	-2.17	4.21	2.04	9.96	8.72	5.62	14.34	24.04
C	-2.23	4.11	1.88	9.38	0.99	4.18	5.17	14.48
J	-2.23	4.18	1.95	10.11	3.35	4.98	8.33	18.27
I	-2.23	4.17	1.94	10.14	3.29	4.99	8.28	18.35
K	-2.25	4.13	1.88	10.07	0.91	4.09	5.00	15.14
MIN	-2.27	2.67	0.40	5.93	-2.20	2.60	0.40	9.31
G	-2.29	4.35	2.06	10.37	2.77	5.15	7.92	17.92
A-1	-2.30	4.98	2.68	11.28	6.78	8.51	15.29	25.78
F-Departure	-2.39	4.94	2.55	10.46	3.72	6.40	10.12	19.69
F	-2.59	4.62	2.03	10.86	3.06	5.61	8.67	22.28

1/ Receipts prior to deduction of purchaser credits and payments to counties.

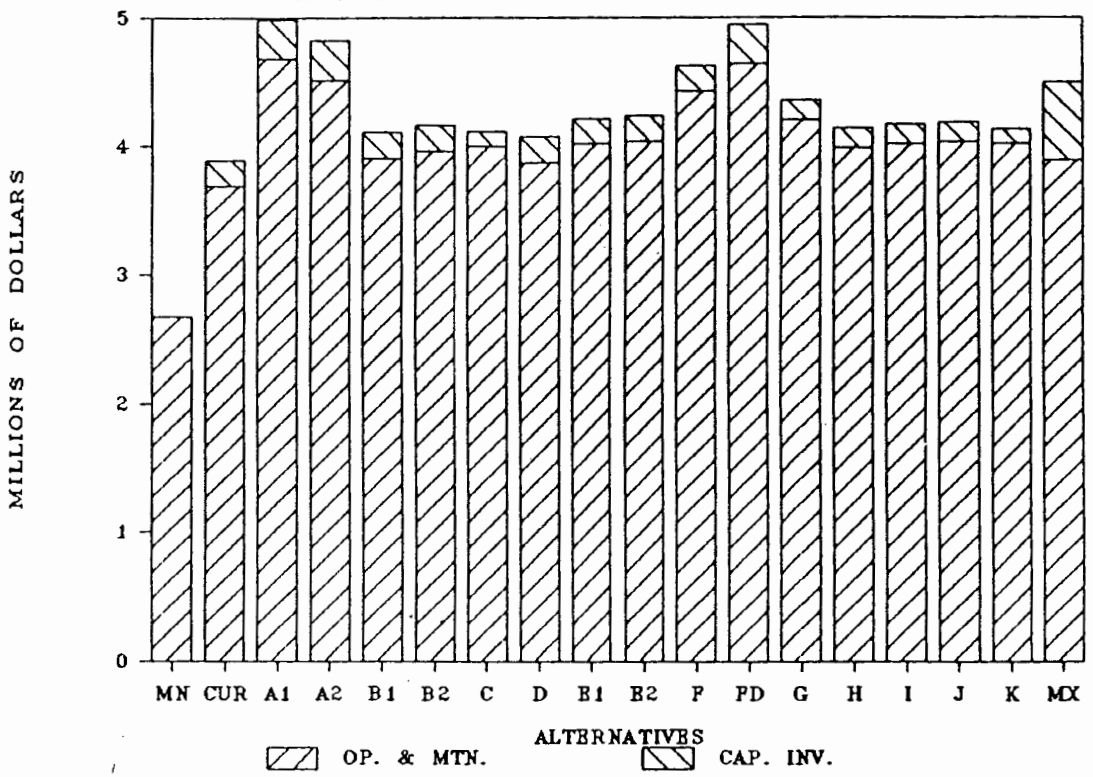
FIGURE 2.22 AVERAGE ANNUAL RETURNS TO THE U.S. TREASURY (Decades 1, 3, and 5)



Budget

The annual Forest Service budget decade 1 by alternative are displayed in Figure 2.23 by cost categories: capital investment, and operation and maintenance. On the Forest, most capital investment costs are for road construction. For a more detailed breakdown of these categories, see Appendix B, Section IV. The annual costs by categories are displayed in Table 2.3 for decades 1 through 5, 10, and 15.

FIGURE 2.23 AVERAGE ANNUAL FIRST DECADE BUDGET OPERATIONS AND MAINTENANCE PLUS CAPITAL INVESTMENTS

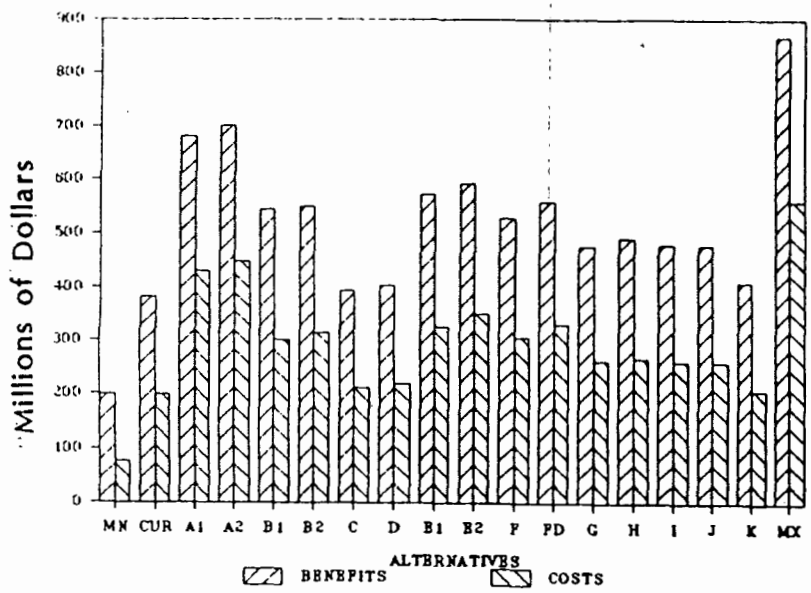


A relatively constant part of the costs in all alternatives is for activities which are not significantly influenced by the objectives of the alternatives (overhead costs). These costs vary from $1.26 million/year to $1.33 million/year and include general administration, fire control, law enforcement, firewood administration, and other programs.

Present Value Costs

The present value cost is the sum of all expenditures for 150 years discounted at 4 percent. The minimum discounted cost for Federal ownership of the Forest is $77.31 million as defined by the minimum level benchmark. The maximum discounted cost is $560.17 million for the maximum PNV benchmark. Figure 2.24 displays how the discounted costs vary among alternatives.

FIGURE 2.24 PRESENT VALUE COSTS AND BENEFITS



Present Value Benefits

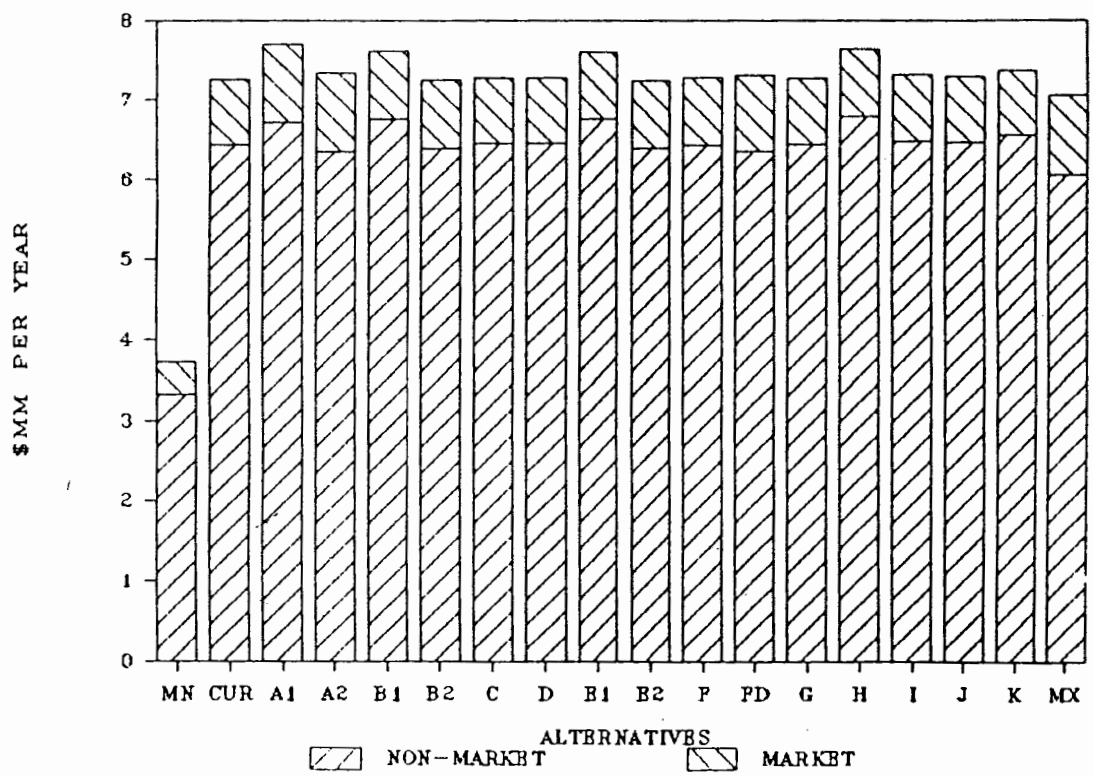
Present value benefits are also displayed in Figure 2.24 by alternative. Present value benefits are the sum of market and non-market values for 150 years discounted at 4 percent. Appendix R, Section IV, contains a more detailed discussion of priced benefits (market and non-market) that are not measurable in dollar terms (non-priced benefits). Discounted economic benefits by major resource category are displayed in Tables 2.17. Annual returns by resource groups for selected decades are displayed in Table 2.3.

The maximum discounted benefits result from managing for maximum present net value as defined by the maximum PNV Benchmark. Total maximum economic benefit for this benchmark is $868.18 million. Total maximum economic benefits excluding non-Forest Service timber benefits is $489.25 million.

Annual Priced Benefit

Annual priced benefits are those values associated with outputs that can be measured in dollars. The average annual economic benefits for decade 1 are displayed in Figure 2.25 by alternative by two resource categories: market and non-market. Market benefits are the sum of the dollar returns to the U.S. Treasury from timber sales, livestock grazing fees, mineral leases, campground fees, special use fees, firewood permits, plus values assigned to livestock grazing and developed recreation use. Non-market benefits are the dollar values assigned to dispersed, wilderness, and wildlife related recreation use. The benefits for range and recreation include actual dollar receipts plus additional assigned values. The purpose of assigning benefit values to some resources is to display the full value that users are willing to pay for that resource. The annual economic benefits for the two resource groups (decades 1 through 5, 10, and 15) are displayed in Table 2.3.

FIGURE 2.25 FIRST DECADE AVERAGE ANNUAL BENEFITS MARKET AND NONMARKET VALUES



Major Tradeoffs Among Alternatives	This section provides additional information to help identify the alternative or alternatives that come closest to maximizing net public benefit while meeting legal and environmental requirements and responding reasonably, equitably and effectively to the issues, concerns, and opportunities. This information describes the tradeoffs that would occur among the priced benefits and the non-priced benefits described previously. The adequacy of each alternative's attempt to address issues, concerns, and opportunities is influenced by the subjective values individual reviewers attribute to the different resource mixes and degrees of response.
National, Regional, and Local Demand Outlook	To provide a framework for assessing responses to issues, concerns, and opportunities, the long-term resource demands and needs of the nation, region, and local communities are reviewed briefly. The RPA projects total national demands to rise for all outputs of National Forests: timber, minerals, forage, outdoor recreation opportunities, and wildlife experiences, including wilderness, water supply and many amenity uses of forest and range lands. There is also a strong demand to protect and enhance the quality of the environment while meeting these demands. The markets into which commodities produced on the National Forests flow are generally regional or national. The nation benefits when supplies are provided from the most efficient sources of production. Most of timber processed from the Forest is marketed in the mid-west; some is used locally. The demand for Forest timber has been steady, even during times of poor regional market conditions. This demand is expected to increase in the future. Oil and gas is used both locally and regionally. The interest and success in the overthrust belt has resulted in a high interest in exploration on parts of the Forest, especially the Rocky Mountain Division. This interest is expected to continue in the future. Forage is used by local ranches during the summer ranching operations. This provides a vital segment of their total forage needs. Cattle are generally shipped throughout the west and mid-west for processing. Some beef is returned to Montana for final processing and consumer sales.

Approximately 185,000 people live in the local area-of-influence. Generally the markets for National Forest outdoor receation, wildlife and wilderness are local people or people from the region adjacent to the National Forest. For example, 88 percent of the U.S. hunters in 1980 did not hunt outside their state. Over 90 percent travelled less than 100 miles from their residences for hunting opportunities.

However, nearby Glacier National Park and the Bob Marshall Wilderness are attracting a growing number of out-of-state visitors.

Water is used locally for fisheries, recreation, and irrigation. It is also used by downstream users on a regional and national level.

Economic Values and Responses to Issues, Concerns, and Resource Use/Development Opportunities

Relationships between priced and non-priced outputs illustrate the interactions of attempting to resolve various issues. Competitive public issues, management concerns, and resource opportunities exist and it is impossible to fully meet all wants and desires at the same time. By examining an array of priced and non-priced outputs it becomes possible to see what is given up and what is achieved as a range of alternatives is explored. An understanding of the tradeoffs between alternatives is required to help decision makers decide which alternative maximizes net public benefit. The mixes of priced and non-priced outputs resulting from each alternative are a direct result of the varied attempts to resolve the public issues discussed in Chapter One.

Appendix A fully discusses each of the issues, concerns, and opportunities. The issues, concerns, and opportunities with the greatest influence on the alternatives and indicators of responsiveness include:

1. Acres to be managed as wilderness or roadless areas. Indicators:

   -- acres of wilderness
   -- acres of roadless management.

2. The level of timber harvest. Indicators:

   -- volume of timber harvested
   -- long-term sustained yield
   -- suitable acres managed for timber production.

3. Quality of habitats and wildlife and fish populations. Indicators:

   -- level of wildlife habitat improvement
   -- elk population potential
   -- catchable trout potential.

4. Contribution of the Forest to the economic development and way of life of nearby communities. Indicators:

   -- number of jobs
   -- income generated in communities
   -- payments to counties.

5. Amount of Threatened and Endangered Species habitat. Indicator:

   -- acres of Management Situation 1 (essential for the survival of the grizzly bear) on the Rocky Mountain Division.

6. The level of oil and gas leasing and exploration. Indicators:

   -- acres of Category A lands. (Withdrawn or proposed for withdrawal from leasing)
   -- acres of Category B lands. (Lands with laws or executive orders requiring specific protection or mitigation measures)
   -- acres of Category C lands. (Lands with special mitigation measures required by the Regional Forester)
   -- acres of Category D lands. (Lands where standard lease stipulations apply).

In addition, the nation as a whole has an interest in ensuring that the Forest is managed in a financially prudent manner while the quality of the physical environment is protected and enhanced. Additional indicators:

   -- budget costs
   -- cash receipts
   -- economic efficiency as measured by present net value
   -- income transfers to Forest users.

Differences and Similarities of Individual Alternatives

The following table and discussion identify the tradeoffs between monetary goals (returns to the Treasury and PNV) and addressing the issues. The descriptions of these differences proceed from the alternatives with the highest PNV to the lowest.

In general the amount of wilderness, roadless, old growth, and visual quality increases as PNV and the level of timber production decrease. Old-growth does not affect the change in PNV between alternatives because the goal for old-growth does not vary between alternatives. The objective is to maintain 5 percent of forested land in timber management areas in old-growth. Anything above that level is a result of other resource goals.

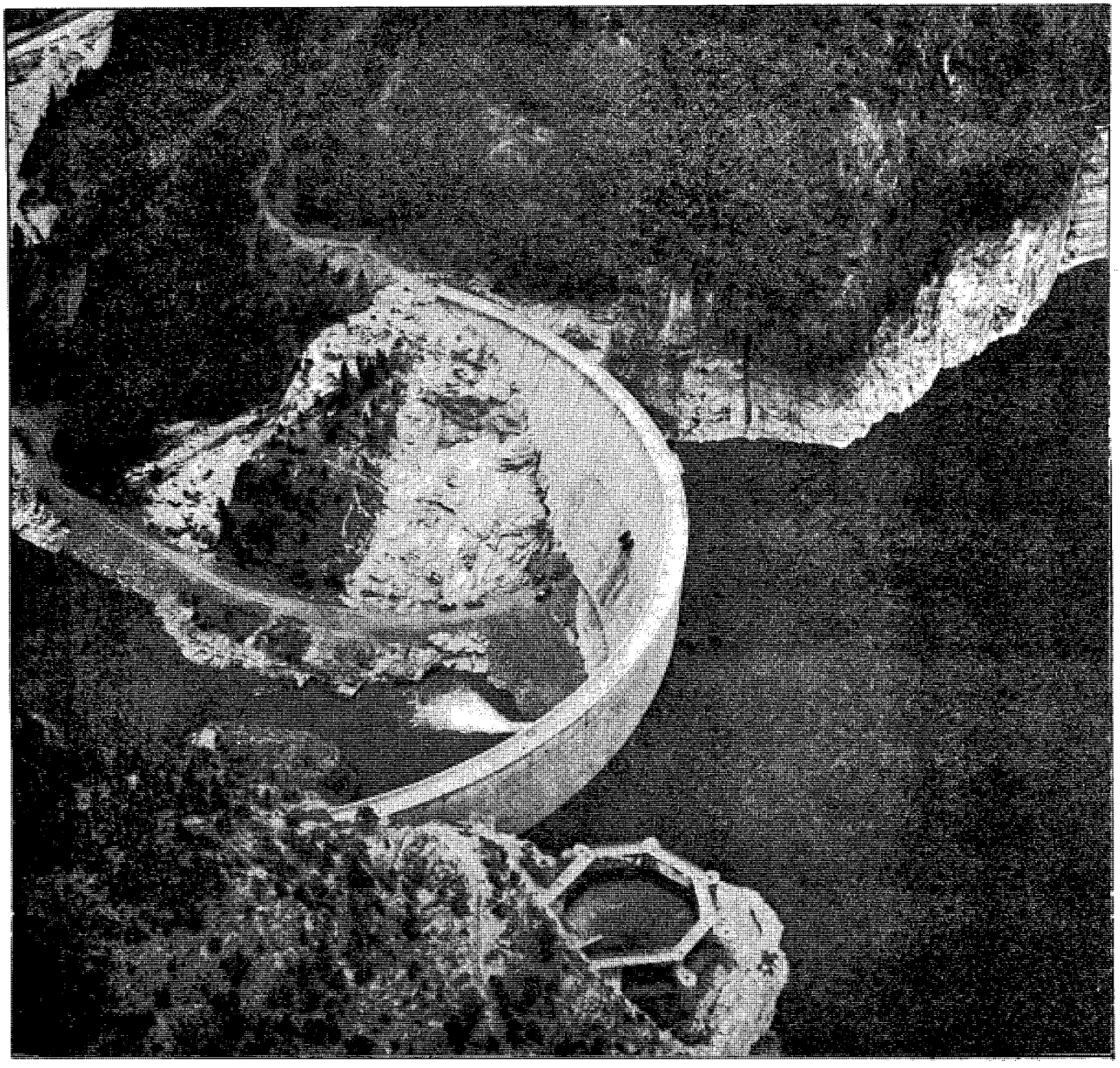
As more wilderness and roadless management areas are designated it affects PNV in two ways: (1) the current and long range timber harvest (LTSY) is less due to the reduced production base and (2) to some extent, harvest is forced into stands with lower timber value and higher access costs. As the area managed for visual quality increases it also affects PNV in two ways: (1) harvest costs increase and (2) the amount of volume removed in the first entry is reduced, decreasing monetary benefits. Water quality/fisheries habitat is protected by delaying harvest near streams. This has an effect on PNV because in order to maintain the same timber output level the harvest is forced into areas with higher access costs and lower timber values.

In Table 2.19 the indicators identified above are used to show the degree of response of each alternative to these issues, concerns, and opportunities.

TABLE 2.19 INDICATORS OF RESPONSIVENESS OF ALTERNATIVES TO MAJOR ISSUES AND NATIONAL CONCERN

	Quantified Costs & Benefits				Timber Issues		
ALTERNATIVE	PNV	Average Annual Net Receipts by Decade 1/5	Average Annual Non-Cash Benefits by Decade 1/5	Average Annual Budget Decade 1	Average Annual Harvest Decade 1	LTSY	Suitable Timber Lands
	$ Millions				Million Board Feet		M Acres
MAX PNV	308.01	-.94/17.35	12.33/38.51	4.49	24.0	43.8	640
A-1	280.89	-2.30/6.78	11.28/25.78	4.98	20.0	41.1	473
E-1	262.41	-2.17/8.72	9.96/24.04	4.21	14.0	34.6	434
A-2	256.80	-1.77/9.95	9.81/19.81	4.82	20.0	43.5	542
B-1	242.61	-2.09/6.17	10.04/20.20	4.10	14.0	32.6	453
E-2	242.48	-2.02/9.43	9.77/23.72	4.23	14.0	38.8	534
B-2	235.20	-1.95/6.43	9.81/19.81	4.16	14.0	33.6	466
F-Departure	229.60	-2.39/3.72	10.46/19.69	4.94	15.5	26.4	309
H	224.48	-2.01/3.70	10.66/18.77	4.14	14.7	23.7	255
F	223.04	-2.59/3.06	10.86/22.28	4.62	14.0	25.4	286
I	219.37	-2.23/3.29	10.14/18.35	4.17	13.0	20.3	281
J	218.86	-2.23/3.35	10.11/18.27	4.18	13.0	20.3	281
G	215.77	-2.29/2.77	10.37/17.92	4.35	14.0	23.8	282
K	200.14	-2.25/0.91	10.07/15.14	4.13	12.4	14.4	202
D	184.47	-1.96/0.54	9.52/14.70	4.07	12.5	16.0	227
Current	182.62	-2.01/0.96	9.38/14.40	3.89	13.0	14.3	196
C	180.30	-2.23/0.99	9.38/14.48	4.11	12.5	18.3	209
MIN	121.18	-2.27/-2.20	5.93/9.31	2.67	0	0	0

	Range	Wilderness & Roadless Areas		Fisheries & Wildlife Issues			Community Effects Issues		
ALTERNATIVE	Livestock Use By Decade Thousand AUMs) 1/5	Recommended Wilderness	Roadless Decade 15	Catchable Trout Potential By Decade 1/5	Elk Population Potential By Decade 1/5	Hunter Days By Decade 1/5	Payments To State Decade 1 $MM/YR	Changes Jobs & Income Decade 1 Jobs Person Years	Income $M/YR
		M Acres		M Potential					
MAX PNV	26.7/33.5	0	0	202/186	8.5/8.6	63.9/53.7	.89	94	1,596
A-1	73.0/86.4	253	59	202/167	8.5/8.1	63.9/50.4	.67	186	1,438
E-1	71.8/84.4	253	282	202/192	8.5/8.2	63.5/55.0	.51	16	266
A-2	73.0/87.5	64	58	202/174	8.5/8.0	63.3/51.6	.76	186	1,438
B-1	73.0/81.4	253	120	202/186	8.5/8.3	63.9/56.3	.50	24	297
E-2	71.8/84.7	64	285	202/192	8.5/8.1	63.4/53.0	.55	13	287
B-2	73.0/81.5	64	255	202/186	8.5/8.2	63.9/56.3	.55	23	266
F-Depature	71.8/79.2	64	714	202/190	8.5/8.4	63.9/57.3	.64	34	472
H	71.1/64.8	664	319	202/204	8.5/8.8	63.0/67.0	.53	80	1,332
F	71.8/79.2	64	716	202/190	8.5/8.4	63.9/60.1	.51	23	260
I	71.6/73.6	235	649	202/202	8.5/8.5	63.4/61.2	.49	20	307
J	71.6/73.6	79	777	202/202	8.5/8.5	63.7/60.5	.49	115	1,733
G	71.1/73.6	52	857	202/202	8.5/8.5	63.7/60.2	.51	7	94
K	71.1/69.9	387	510	202/208	8.5/9.2	63.9/71.9	.47	14	124
D	73.0/89.9	64	676	202/170	8.5/7.8	62.9/56.9	.53	1	110
Current	72.3/72.3	64	531	202/202	8.5/8.5	63.9/63.9	.47	0	0
C	71.1/70.0	64	730	202/208	8.5/9.3	65.9/71.9	.47	1	9
MIN	71.1/0	0	1002	202/212	8.5/10.0	65.0/82.8	.10	-246	-2970



Gibson Dam in the Rocky Mountains.

Economic Tradeoffs

The following section discusses the major economic tradeoffs among the alternatives and issues addressed by each alternative. The alternatives are listed in order of decreasing PNV. For a more detailed discussion of resource constraints see Appendix B.

The maximum PNV benchmark identifies the maximum PNV of the Forest at $308 million. A timber sale program of 24 million board feet/year in the first decade, would be achieved while meeting minimum management requirements and allowing timber volumes to increase 20 percent or decrease 30 percent from one decade to another. In the relative absence of competing goals of other resources, timber harvest occurs on the most economically efficient lands. All roadless areas except Silver King-Falls Creek (32,000 acres), Renshaw (31,304 acres), and Deep Creek-Reservoir North (41,838 acres) would be available for timber harvest subject to achieving maximum PNV. A total of 622,295 acres would be managed for timber production out of 679,917 tentatively suitable acres. Thus, with relatively low non-commodity resource goals, 92 percent of the tentatively suitable timber lands can be efficiently managed for timber production.

Alternative A-1

Alternative A-1 has the highest PNV of all the alternatives. This alternative has high levels of livestock grazing and the second highest level of timber harvest. Under this alternative by 2030, 41.0 million board feet of timber would be sold annually. Employment and income increases would be the greatest under this alternative (and with A-2). This alternative would harvest timber on more lands which are low in productivity, high in development costs, and environmentally more sensitive.

Under all alternatives the early decades show a negative net receipts mainly because the construction of roads to access undeveloped timber require a large initial investment that exceeds the value of standing timber. Receipts in later decades will amortize this cost and will return a profit.

Alternative A-1 would maximize the exploration and development of potential oil and gas reserves. Livestock grazing would increase from the current level of 71,000 AUMs to 86,400 AUMs annually.

The quality of elk hunting and threatened and endangered species habitat would be reduced the most under Alternatives A-1 and A-2. These alternatives provide the second lowest amount of potential elk habitat. They also provide the least elk hunter days. Wildlife would be adversely impacted, especially big-game. A loss in wildlife habitat would indirectly affect the social and economic environment by reducing the amount and quality of recreation associated with big-game hunting. Even though wildlife habitat improvement would triple, most of this increase would be directed at mitigating the impacts of timber harvest, livestock grazing, and oil and gas exploration.

Most of the semi-primitive recreation areas of high public interest would be roaded and developed by 2030. However, the Forest's two MWSA areas (Middle Fork Judith and Big Snowies) and Silver King-Falls Creek and Renshaw roadless areas would be recommended for wilderness designation.

Although Alternative A-1 has the highest PNV, it ranks second lowest in terms of maximizing qualitative net public benefits. Alternative A-1 would cause the greatest change in the environment after Alternative A-2.

Alternative E-1

Alternative E-1 is similar to Alternatives A-1 in emphasizing timber and range outputs. However E-1 focuses on obtaining commodity outputs from the Jefferson Division while stressing non-extractive uses, such as semi-primitive recreation and wildlife habitat, in the Rocky Mountain Division.

Under this alternative, by 2030, 33.1 million board feet of timber would be offered for sale annually and livestock grazing would increase from 71,100 AUMs to 84,400 AUMs. To achieve the harvest level approximately 434,000 acres would be included in the suitable timber lands, again including areas low in productivity, high in development costs, and more environmentally sensitive.

Since no regulated timber harvest would occur on the Rocky Mountain Division, the timber sale program under E-1 would be more cost-effective than in A-1 (or A-2). However, timber harvest levels are lower. As a result, the PNV of Alternative E-1 is $ 18 million lower than Alternative A-1.

Under Alternative E-1 the quality of T&E Species habitat would increase. However, the quality of elk hunting on the Jefferson Division would decrease considerably. This alternative provides the fourth lowest amount of potential elk habitat and elk hunter days.

Alternative E-1 has the same wilderness recommendations as A-1 including the Middle Fork Judith and Big Snowies MWSA areas and Silver King-Falls Creek and Renshaw roadless areas.

Although the PNV of this alternative ranked fairly high, the qualitative net public benefits would be very low in the Jefferson Division.

Alternative A-2

Alternative A-2 is similar Alternative A-1 except that this alternative recommends non-wilderness designations for the Forest's two MWSA areas. Timber and range levels would be slightly higher than Alternative E-1. The timber sale program, by the end of the planning period, is the highest under this alternative (along with Alternative A-1) and grazing levels are second only to Alternative D. This alternative comes closest to meeting RPA objectives for these commodities.

Despite the increase in these levels over Alternative E-1, there is a $5.6 million decrease in PNV. This decrease is primarily attributed to the MWSA areas not being classified as wilderness. A higher recreation value for wilderness recreation is the primary reason for Alternative E-1 having a higher PNV than Alternative A-2.

Alternative B-1

Alternative B-1 would increase timber and domestic grazing from the current level to the mid-point between current management and the RPA recommended program. By 2030, the annual timber sale program would be 23.7 million board feet and livestock grazing would increase from 71,100 AUMs to 81,400 AUMs. Like Alternative A-2, this alternative stresses commodity production from both the Rocky Mountain and Jefferson Divisions. Wildlife habitat would not be emphasized under this alternative; rather, it would be dependant on timber and range programs. This alternative provides the fifth lowest amount of potential elk habitat and elk hunter days.

Alternative B-1 has the same wilderness recommendations as Alternatives A-1 and E-1. As was the case with these two alternatives, there would be a loss of many semi-primitive recreation opportunities because of the roading of undeveloped lands. There would be a corresponding increase in the opportunity for dispersed recreation activities in a roaded natural setting.

The quality of elk hunting and T&E Species habitat would decrease significantly with increased commodity production and reduced amounts of wildlife habitat improvement. Big game and other wildlife populations would decrease, although the decrease on the Jefferson Division would be less than in Alternative E-1.

Along with the wildlife decrease there would be a loss in recreation and hunting opportunities and the economic benefits from these activities. The moderate increases in commodity production would benefit local communities through increased income and employment opportunities, though less than Alternative A-2.

The PNV of alternative B-1 is approximately $14 million less than alternative A-2. This is primarily due to the decreased timber sale program. The reduced amount of wildlife improvement in Alternative B-1 adds a slight amount to its total PNV. Though this alternative ranks high in PNV, it is low in the evaluation of qualitative net public benefits. This alternative would have significant effects on the biologic, social, and economic environments.

Alternative E-2

This alternative is similar to Alternative E-1 except that the two MWSA areas are not recommended for wilderness designation. The timber and livestock grazing levels are slightly greater than Alternative E-1. By 2030, this alternative would have a program of 34 million board feet and 84,700 AUMs annually.

The PNV less than the maximum PNV benchmark of this alternative is $65 million. The decrease in PNV from E-1 is due primarily to higher recreation values attributed to wilderness recreation in the MWSA areas.

Comparisons with Alternative B-1 are essentially the same as between Alternatives E-1 and B-1 except (1) slightly higher commodity levels in E-2, (2) the difference in the treatment of the MWSA areas and (3) the resulting decrease in wilderness recreation opportunity and elk hunting recreation.

Alternative B-2	Alternative B-2 is similar to B-1 except that the two MWSA areas are not recommended for wilderness designation. Program levels are essentially the same except for wilderness recreation. The PNV of Alternative B-2 is $73 million less than the maximum PNV benchmark. Again, the decrease in PNV from Alternative B-1 is because the MWSA areas would be recommended for non-wilderness. The relative comparisons between this alternative and Alternative E-2 are the same as between Alternatives E-1 and B-1. As with Alternative E-2, this alternative is low in the evaluation of net qualitative public benefits. There would be declines in wildlife habitat and numbers, semi-primitive recreation opportunities, elk hunting quality, and quality of T&E Species habitat.
Alternative F-Departure	This alternative aims to increase timber and range levels while maintaining dispersed recreation opportunities in a semi-primitive setting. This alternative would recommend wilderness classification for Silver King-Falls Creek (32,000 acres) and Renshaw (31,304). An additional 714,000 acres would remain in a roadless condition through the 150-year planning horizon. The MWSA areas would be managed for nonwilderness. Under this alternative, the timber program would rise 2.5 million board feet above the current harvest level in the first decade, climb to 20.1 million board feet the second decade, and would depart from long-term sustained yield capacity of 26.4 million board feet in both the third (27.1 million board feet) and fourth (28.1 million board feet) decades. This departure schedule would be an attempt to reduce or prevent high mortality in lodgepole pine stands which could result from potential epidemic infestations of the mountain pine beetle. About 309,000 acres of land would be classified as suitable for timber management. This is less than all of the previous alternatives. This alternative would provide an increase in livestock grazing from 71,100 AUMs to 79,200 AUMs by 2030. Some of this grazing increase would occur on big-game winter range and riparian zones. One result of the increase in grazing and timber levels is a decrease in elk and trout population potentials. Alternative H would have a potential population of 8800 elk while F-Departure would have a

potential of 8400 elk by 2030 (Current Plan Alternative would have 8500 elk). The potential trout population would be 204,000 for Alternative H, 190,000 for Alternative F-Departure, and 202,000 for the Current Plan Alternative. Elk hunter days would decrease by 6600 thousand days.

The PNV difference of this alternative and the maximum PNV benchmark is $78 million. The PNV is lower than many of the previous alternatives primarily due to lower timber harvest levels resulting from the decision to retain areas of high public interest in a non-wilderness, semi-primitive recreation setting. This classification holds down the PNV by reducing the amount of land available for timber management or wilderness classification which products higher valued wilderness RVDs. Allowing a departure from non-declining yield increases the PNV slightly, but not enough to offset the effect of retaining semi-primitive recreation areas. Implementation of a departure schedule would require immediate increases in funding for roads, rights-of-ways, and personnel.

Alternative H

Alternative H is different from any of the previously discussed alternatives in that it would significantly increase the lands classified as wilderness, while increasing timber levels from those lands that are presently developed. Alternative H would almost triple the Forest's wilderness opportunity by recommending 664,326 acres for wilderness classification.

All roadless areas except Badger-Two Medicine and Deep Creek-Reservoir North (further planning area) would be recommended for wilderness. The Big Snowies MWSA area would be managed for semi-primitive recreation. The Middle Fork Judith MWSA area would be managed for semi-primitive recreation and wildlife, except for the Harrison Creek Drainage which would be managed for timber production. Alternative H would limit mineral exploration and development, while protecting wilderness values. In areas recommended for wilderness, valid mining claims and existing oil and gas leases would be managed under mineral laws and the Wilderness Act. Oil and gas leases would not be reissued.

The quality of elk hunting and T&E Species habitat would be maintained, much of it in an undeveloped state. This alternative provides the third highest amount of potential elk habitat and the second highest elk hunter days.

Livestock grazing would decrease from 71,100 AUMs to 64,800 AUMs. Dispersed recreation opportunities in a roaded natural setting would remain constant.

By 2030, 22.4 million board feet of timber would be offered for sale annually. The suitable lands for timber production would be approximately 255,000 acres. Timber harvest would be intensively concentrated on the presently roaded lands. To achieve the identified harvest level some uneconomical lands would be harvested and elk habitat on roaded land would be significantly reduced.

The PNV of Alternative H is $83 million less the maximum PNV benchmark. The PNV is lower than the previous alternatives, about $6 million lower than Alternative F-Departure, due primarily to lower timber harvest and grazing levels. The negative effect of these lower levels on PNV is partially offset by the increase in wilderness RVDs due to most roadless areas being recommended for wilderness classification.

Alternative F

Alternative F has a PNV of $83 million less than the maximum PNV benchmark. The lower PNV is again largely due to maintaining areas in a semi-primitive condition in response to public issues and concerns. There is less than $1 million decrease in PNV from Alternative H due primarily to the reduced level of wilderness RVDs. Alternative F also has a slightly higher cost than Alternative H due primarily to higher roading costs.

Alternative F, like Alternative H would have a 14.0 million board feet annual timber program during the first decade. However, under Alternative F the annual program would increase to 24.0 million board feet by 2030 and eventually reach the long-term sustained yield harvest of 25.4 million board feet. About 286,000 acres of the Forest would be suitable for timber management. Alternative F identified 24,160 acres for timber management in the Middle Fork Judith MWSA area com-pared to 11,600 acres identified for such management in Alternative H. The remainder of the Middle Fork Judith and Big Snowies MWSA areas would be managed the same as in Alternative H (wildlife and semi-primitive recreation).

Under Alternative F, livestock grazing would increase from 71,000 AUMs to 79,200 AUMs by 2030. Adverse impacts on wildlife habitat would be mini-

mized through coordination. However, some increases in livestock grazing would occur on big-game winter range and riparian zones. There would be an estimated reduction from 8,500 to 8,400 in the elk population potential by 2030. The catchable trout potential would also decrease by 2030 from the current 202,000 fish to 190,000 fish. Elk hunter days would decrease from 63,900 to 60,100 days.

Silver King-Falls Creek (32,000 acres) and Renshaw (31,304 acres) roadless areas would be recommended for wilderness classification. These two areas total 63,304 acres compared with the 664,326 acres recommended for wilderness classification under Alternative H. Most semi-primitive recreation settings would be retained (716,000 acres), though not as many acres as in Alternative H.

Oil and gas exploration would be less limited in this alternative than in Alternative H.

Like Alternative H, Alternative F is about in the middle of the alternative PNVs and also ranks high in net public benefits. It does not rank quite as high as Alternative H in net public benefits because of reduced wildlife populations, greater conflicts between wildlife and livestock, fewer acres retained in a semi-primitive setting, and more limited oil and gas exploration possibilities.

Alternative I

Alternative I would increase the wilderness opportunity, especially on the Rocky Mountain Division. Wilderness recommendations would be made for the following areas on the Rocky Mountain Division: Teton (39,845 acres); Renshaw (45,864 acres); Benchmark-Elk Creek (26,027 acres); Silver King-Falls Creek (35,568 acres); and on the Jefferson Division: Tenderfoot-Deep Creek (88,400 acres). Another 649,000 acres of land would be in a roadless condition in 2030.

The MWSA areas would be managed as in Alternative H. The timber sale program would increase from current levels but would be less than Alternative F, reaching 22.0 million board feet by 2030. This increase would occur on the Jefferson Division. Management for timber production would occur on 281,000 suitable acres.

Livestock grazing would increase to 73,600 AUMs, also less than Alternative F. The quality of elk hunting and habitat for T&E Species would be main-

tained. Other wildlife habitat would be maintained or improved. The elk and trout population potential would be maintained at the current levels (8500 elk and 202,000 fish). Elk hunter days would decrease by 2700 days.

This alternative has a PNV of $89 million less than the maximum PNV benchmark. The PNV is about $4 million less than Alternative F. Retaining areas of high public interest in non-wilderness, semi-primitive recreation settings and having lower timber levels kept Alternative I's PNV lower than Alternative F. However, the additional wilderness RVDs in this alternative partially offset the lower timber harvest levels. Although the PNV of this alternative is low, the qualitative net public benefit is high.

Alternative J

Alternative J would recommend three areas for wilderness classification: Renshaw (21,880 acres); Silver King-Falls Creek (7,625 acres); and Tenderfoot-Deep Creek (49,500 acres). An additional 777,000 acres would remain in a roadless condition in 2030. The MWSA areas would be managed the same as in Alternative H.

As in Alternative I, the timber program would be 22.0 million board feet by 2030.

The PNV difference of this alternative and the maximum PNV benchmark is the same as Alternative I, $89 million. Again, retaining areas of high public interest in a semi-primitive recreation setting and harvesting reduced timber levels lowered the PNV. Because less areas are recommended for wilderness classification than in Alternative I, the PNV is slightly lower.

Alternative G-(Preferred)

Alternative G (Preferred) has timber and range levels quite similar to Alternative J. By 2030, 20.0 million board feet of timber would be available from 282,307 acres suitable for timber management. The long-term sustained yield would be 23.8 million board feet compared with 20.3 million board feet for Alternatives I and J. Most of the timber would be harvested on the Jefferson Division. The Rocky Mountain Division would be limited to an annual small sales program of 0.5 million board feet for local needs.

Livestock grazing would increase from 71,000 to 73,600 AUMs by 2030. No increase in livestock grazing would be permitted on big-game winter range or riparian zones, unless wildlife needs could be fully met.

Alternative G recommends fewer wilderness acres for classification than Alternative J (approximately 52,000 compared to 79,000). On the Rocky Mountain Division, Renshaw (19,144 acres); Silver King-Falls Creek (18,190 acres); Teton (10,870 acres); and Benchmark-Elk Creek (3,630 acres) would be recommended for wilderness classification. No areas would be recommended for wilderness on the Jefferson Division. This alternative would retain the largest amount of semi-primitive roadless area (approximately 816,000 acres). Almost all semi-primitive areas of public interest would be retained and provide a wide range of dispersed recreation opportunities. The two MWSA areas would be managed the same as in Alternative H.

As in Alternative J the elk population potential would remain constant although hunter days are projected to decrease by 3700 days. The quality of elk hunting and habitat for T&E Species would be maintained.

Alternative G has a present net value of $216 million. This is $3.6 million and $3.1 million less than Alternatives I and J respectively. Compared with the maximum PNV benchmark, the difference is $92 million. Retaining a large percentage of areas of high public interest in a semi-primitive recreation setting lowered the PNV of this alternative.

Alternative G would have a slightly higher first decade timber and a higher long-term sustained yield value than Alternatives I or J. This increases Alternative G's PNV, but due to additional roading costs and fewer wilderness RVDs, the PNV difference is slightly higher. Although Alternative G is in the middle of PNV rankings, it is the alternative which the interdisciplinary team determined came closest to maximizing net public benefits.

Alternative K

Alternative K has a PNV of $200 million. This is $15 million less than Alternative G and represents a difference of $108 million when compared with the maximum PNV benchmark. Low timber program and harvesting levels and not scheduling development for semi-primitive areas account for the drop in PNV in this alternative. The contribution from increased wilderness RVDs due to the amount of recommended wilderness (second only to Alternative H) were sustantial but not enough to entirely offset the lower timber and range levels.

Alternative K emphasizes an increase in the Forests wildlife program, increased wilderness opportunities, retention of the remaining semi-primitive areas, and maintenance of the current timber harvest levels.

The timber program would be held constant at 12.4 million board feet annually through 2030. This is slightly less than the current harvest level. About 202,000 acres of the Forest would be suitable for timber management. The long-term sustained yield would be 14.4 million board feet. Timber harvesting would be precluded in areas that are currently in a semi-primitive setting except for Harrison Creek of the Middle Fork Judith MWSA area. Both MWSA areas would be managed as in Alternative H. Most of the timber harvesting would occur on the Jefferson Division with only a small sale program on the Rocky Mountain Division.

Livestock grazing would decrease slightly from 71,100 AUMs to 69,900 AUMs by 2030. The Forests capacity for wintering big-game animals would be increased by almost tripling the wildlife habitat improvement program and by decreasing livestock grazing on the Forest. Elk population potential would increase to 9,200 from the current 8,500 elk. Catchable trout potential would also increase from 202,000 to 208,000 fish. Elk hunter days would increase by 8,000 days.

Alternative K would recommend 387,106 acres for wilderness classification compared to the 46,844 acres in Alternative G. On the Rocky Mountain Division these areas include: Teton (63,133 acres), Renshaw (57,591 acres), Benchmark-Elk Creek (32,314 acres), and Silver King-Falls Creek (35,568 acres). On the Jefferson Division the areas include: Tenderfoot-Deep Creek (88,400 acres), Crazy Mountains (16,600 acres), Pilgrim Creek (49,500 acres), and Big Baldy (44,000 acres). These additions would more than double the wilderness opportunity on the Forest.

Other than hunting RVDs, overall recreation use would be similar to Alternative G. However, the value of recreation use would increase since some of the use is computed as higher valued wilderness RVDs in those areas recommended for wilderness classification. Elk hunter days are projected to increase based primarily on the lower timber harvest levels and fewer miles of road construction.

Oil and gas exploration and development opportunities would be much less than in Alternative G. Valid mining claims and oil and gas leases would be

managed under mineral laws and the Wilderness Act. Oil and gas leases in areas recommended for wilderness classification would not be reissued.

Although the PNV of this alternative is low compared to the other alternatives, it would provide the highest non-priced public benefits.

Alternative D

Alternative D has a PNV which is $16 million lower than Alternative K. The difference of this alternative is $124 million when compared to the maximum PNV benchmark. Like Alternative K, the PNV is low because of less timber harvest and retaining areas in a semi-primitive recreation setting. Unlike Alternative K, however, Alternative D's PNV is not boosted substantially by increased wilderness RVDs. An increase in livestock grazing AUMs does result in some PNV increase.

Timber program levels are essentially the same as Alternative K through 2030. The long-term sustained yield level would be 16.0 million board feet based on 227,000 acres suitable for timber management. Alternative D foregoes the opportunity to increase the timber sale program even where conflicts with other resources are minimal.

Livestock grazing would increase from the current level of 71,100 AUMs up to 89,900 AUMs. This is the highest domestic grazing level of all the alternatives. There would be a decrease in the quality of elk hunting due to the increase in grazing on big-game winter ranges. The elk population potential would decrease from 8,500 elk currently to 7,800 by 2030, the lowest amount of any alternative. Elk hunter days would decrease from 63,900 to 56,900 days. Increased sedimentation due to increased grazing in riparian areas would reduce the catchable trout potential from 202,000 to 170,000 fish. Alternative D would program wildlife habitat improvement at levels slightly lower than the current program.

Alternative D would recommend 63,304 acres for wilderness classification. The recommendation includes Renshaw (32,000 acres), and Silver King-Falls Creek (31,304 acres). Another 676,000 acres would be retained in a semi-primitive recreation setting. The MWSA areas would be managed for semi-primitive recreation opportunities and for timber management the same as in Alternative H.

	Alternative D would have significant impacts on some biological and economic environments. The large increase in livestock grazing would benefit some individuals and communities which depend on ranching by increasing job opportunities and income. However, the decrease in big-game populations would have adverse social and economic effects by decreasing recreation opportunities associated with wildlife, especially the economic benefits of big-game hunting. Alternative D has a low PNV and also ranks low in non-priced public benefits. The ranking of this alternative is quite low in terms of net public benefits.
Current Plan Alternative (No Action Alternative)	The PNV of the Current Plan Alternative is $183 million. This is a difference of $125 million compared to the maximum PNV benchmark. Under the Current Plan Alternative, the Forest would produce 13 million board feet of timber and 71,100 AUMs of livestock grazing yearly. About 196,000 acres would be suitable for timber management. Much of the harvest would occur in currently roadless areas. The long-term sustained yield of 14.3 million board feet is the lowest of any of the alternatives. Wildlife habitat improvement would be done on about 460 acres yearly. The elk population potential would remain static at 8,500 elk, the catchable trout potential at 202,000 fish, and elk hunter days at 63,900 days. The Current Plan Alternative has the same wilderness recommendations as Alternative D, 63,304 acres. An additional 531,000 acres would be retained in a semi-primitive recreation setting. The two MWSA areas are managed to protect their wilderness characteristics until Congress acts on their wilderness suitability. The PNV of the Current Plan Alternative is low due to the comparatively low level of timber harvest and livestock grazing.
Alternative C	Alternative C has a PNV of $180 million. This is the lowest PNV of all of the alternatives considered in detail. The is a difference of this alternative is $123 million compared to the maximum PNV benchmark.

Alternative C would emphasize the wildlife program on the Forest. The timber harvest level would be 12.5 million board feet which is slightly less than the current level. The long-term sustained yield capability of Alternative C would be 18.3 million board feet based on 209,000 suitable acres. Timber harvesting would be precluded in most areas that are currently in a semi-primitive setting. Livestock grazing would decrease slightly to 70,000 AUMs by 2030. The slight decrease in grazing would improve habitat for big-game, especially on winter range. The decrease in grazing would have a small economic impact on ranching communities.

The wilderness recommendation of Alternative C would be 63,304 acres, the same as the Current Plan Alternative. Alternative C, however, would retain considerably more acres in a semi-primitive setting than would the Current Plan. Alternative C would retain nearly all semi-primitive areas of high public interest (730,000 acres) in a semi-primitive recreation setting with an emphasis on improving wildlife habitat. The quality of elk hunting and T&E species and other wildlife habitat would increase. About 1,230 acres of wildlife habitat improvement would be programmed annually. The elk population potential would increase from the present 8,500 elk to 9,300, by 2030. The population potential is the highest of any of the alternatives. Elk hunter days would increase from 63,900 to 71,900 (along with Alternative K the highest of any alternative). The catchable trout population would also increase, rising from 202,000 fish to 208,000 by 2030.

Oil and gas development would have more restrictions than the Current Plan because semi-primitive areas would be protected by non-surface occupancy stipulations.

The MWSA areas would be managed entirely for semi-primitive recreation and wildlife habitat, especially elk habitat. Wildlife habitat improvement practices would be applied in these areas.

The PNV is reduced due to low timber harvest levels, reduced livestock grazing, higher wildlife habitat improvement costs, and by not scheduling development on more semi-primitive areas. Although this alternative had the lowest PNV, non-priced public benefits rank very high and many publics felt this alternative maximized not public benefits.

TABLE 2.3

RESOURCE OUTPUT SUMMARY FOR ALTERNATIVES AND BENCHMARKS

RESOURCE	UNIT OF MEASURE	1984	MIN LEVEL	CURRENT DIRECTION	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D
Recreation Use Potential										
Developed	MRVD	198								
Decade 1			0	198	198	198	198	198	198	198
Decade 3			0	198	207	207	198	198	203	207
Decade 5,10,15			0	198	230	230	198	198	213	230
Primitive	MRVD	47								
Decade 1			47	52	84	52	84	52	52	52
Decade 3			47	52	84	52	84	52	52	52
Decade 5,10,15			47	52	84	52	84	52	52	52
Semi-Primitive	MRVD	223								
Decade 1			223	199	178	194	179	194	214	209
Decade 3			223	196	176	182	172	186	214	206
Decade 5			223	193	153	170	158	175	211	205
Decade 10				178	123	135	134	141	205	200
Decade 15				169	121	122	120	124	204	199
Roaded Natural	MRVD	1905								
Decade 1			1905	1948	1985	1989	1960	1964	1943	1947
Decade 3			1905	2033	2144	2158	2069	2082	2018	2032
Decade 5			1905	2119	2303	2326	2178	2200	2094	2116
Decade 10				2179	2383	2446	2273	2328	2112	2131
Decade 15				2239	2463	2566	2368	2455	2129	2146
Rural	MRVD	194								
Decade 1			194	194	194	194	194	194	194	194
Decade 3			194	194	194	194	194	194	194	194
Decade 5			194	194	194	194	194	194	194	194
Decade 10			194	194	194	194	194	194	194	194
Decade 15			194	194	194	194	194	194	194	194
Wilderness										
Existing Acres	M Acres	384	384	384	384	384	384	384	384	384
Recommended			0	64	253	64	253	64	64	64
Roadless	M Acres	531								
Decade 15			1002	531	59	58	120	255	730	676
Visual Quality Obj.	M Acres									
Decade 5										
Preservation			448	448	637	448	637	448	448	448
Retention			42	231	42	42	42	42	42	42
Partial Retention			1353	573	394	429	338	444	824	826
Modification			0	591	770	924	826	909	529	527
Wildlife										
Habitat Improvement	Acre of Structures	466								
Decade 1			0	466	1162	1248	426	444	1228	452
Decade 3			0	466	1160	1244	418	442	1228	452
Decade 5			0	466	1138	1236	410	440	1228	440
Decade 10,15			0	466	1138	1236	410	440	1228	440
Elk Population Potential	Number	8500								
Decade 1			8500	8500	8500	8500	8500	8500	8500	8500
Decade 3			9200	8500	8400	8300	8400	8300	8900	8100
Decade 5			10000	8500	8100	8000	8300	8200	9300	7800
Decade 10,15			10000	8500	8100	8000	8300	8200	9300	7800

ALT E-1	ALT E-2	ALT F	ALT F (DEP)	ALT G (PREF)	ALT H	ALT I	ALT J	ALT K	MAX PNV
198	198	198	198	198	198	198	198	198	198
201	201	207	207	207	207	207	207	203	198
203	203	230	230	230	230	230	230	213	198
84	52	52	52	54	203	78	59	118	47
84	52	52	52	54	203	78	59	118	47
84	52	52	52	54	203	78	59	118	47
180	196	196	194	197	57	178	190	139	196
175	190	188	187	192	56	174	186	138	194
160	171	185	179	183	55	166	184	138	164
134	137	172	169	177	53	158	171	132	114
120	119	167	168	171	53	152	164	130	111
1974	1978	1905	1973	1958	1986	1952	1959	1953	2045
2111	2123	2061	2081	2028	2000	1996	2003	1961	2208
2248	2269	2202	2232	2134	1938	2099	2146	1965	2521
2348	2399	2298	2346	2229	2106	2210	2213	2054	3216
2448	2529	2358	2363	2306	2102	2295	2308	2094	3256
194	194	194	194	194	194	194	194	194	194
194	194	194	194	194	194	194	194	194	194
194	194	194	194	194	194	194	194	194	194
194	194	194	194	194	194	194	194	194	194
194	194	194	194	194	194	194	194	194	194
384	384	384	384	384	384	384	384	384	384
253	64	64	64	52	664	235	79	387	0
282	285	716	714	857	319	649	777	511	0
637	448	452	452	439	1049	619	463	772	384
42	42	42	42	42	42	42	42	42	42
453	470	833	588	839	294	588	716	544	167
711	883	516	761	452	458	594	622	485	1250
728	746	698	698	850	498	704	702	853	136
726	742	694	694	846	497	704	701	863	136
716	718	678	678	950	496	703	701	863	138
710	718	678	678	950	496	703	701	863	136
8500	8500	8500	8500	8500	8500	8500	8500	8500	8500
8400	8300	8500	8500	8500	8800	8500	8500	8900	9000
8200	8100	8400	8400	8500	8800	8500	8500	9200	8600
8200	8100	8400	8400	8500	8800	8500	8500	9200	8500

RESOURCE	UNIT OF MEASURE	1984	MIN LEVEL	CURRENT DIRECTION	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D
Elk Hunter Days	Thousand Hunter Days	65.0								
Decade 1			65.0	63.9	63.9	63.3	63.9	63.9	63.9	62.9
Decade 3			73.8	63.9	58.4	57.4	62.3	58.5	69.9	61.0
Decade 5,10,15			82.8	63.9	50.4	51.6	56.3	56.3	71.9	56.9
Catchable Fish Potential	Thousand Fish	202								
Decade 1			202	202	202	202	202	202	202	202
Decade 3			208	202	188	192	196	196	204	192
Decade 5,10,15			212	202	167	174	186	186	208	170
Potential Livestock Use	Thousand AUMs	71.0								
Decade 1			71.0	71.0	73.0	73.0	73.0	73.0	71.1	73.0
Decade 3			0	71.0	81.5	82.2	77.9	78.0	70.0	83.0
Decade 5,10,15			0	71.0	86.4	87.5	81.4	81.5	70.0	89.9
Timber Sale Program	MMBF/Yr. (MMCF/Yr.)	13.0 3.8								
Decade 1			0 (0)	13.0 (3.8)	20.0 (5.9)	20.0 (5.9)	14.0 (4.1)	14.0 (4.1)	12.5 (3.7)	12.5 (3.7)
Decade 3			0 (0)	13.0 (3.8)	34.0 (10.0)	34.0 (10.0)	20.3 (6.0)	20.3 (6.0)	12.5 (3.7)	12.5 (3.7)
Decade 5			0 (0)	13.0 (3.8)	41.0 (12.1)	41.0 (12.1)	23.7 (7.0)	23.7 (7.0)	12.5 (3.7)	12.5 (3.7)
Decade 10			0 (0)	13.0 (3.8)	41.0 (12.1)	41.0 (12.1)	23.7 (7.0)	23.7 (7.0)	12.5 (3.7)	12.5 (3.7)
Decade 15			0 (0)	13.0 (3.8)	41.0 (12.1)	41.0 (12.1)	23.7 (7.0)	23.7 (7.0)	12.5 (3.7)	12.5 (3.7)
Annual Allowable Sale Quantity	MMBF/Yr. (MMCF/Yr.)									
Decade 1			0 (0)	11.2 (3.3)	17.4 (5.1)	17.4 (5.1)	12.1 (3.6)	12.1 (3.6)	10.9 (3.2)	10.9 (3.2)
Decade 3			0 (0)	11.2 (3.3)	29.6 (8.7)	29.6 (8.7)	17.7 (5.2)	17.7 (5.2)	10.9 (3.2)	10.9 (3.2)
Decade 5			0 (0)	11.2 (3.3)	35.8 (10.5)	35.8 (10.5)	20.7 (6.1)	20.7 (6.1)	10.9 (3.2)	10.9 (3.2)
Decade 10			0 (0)	11.2 (3.3)	35.8 (10.5)	35.8 (10.5)	20.7 (6.1)	20.7 (6.1)	10.9 (3.2)	10.9 (3.2)
Decade 15			0 (0)	11.2 (3.3)	35.8 (10.5)	35.8 (10.5)	20.7 (6.1)	20.7 (6.1)	10.9 (3.2)	10.9 (3.2)
Long-Term Sustained Timber Yield	MMBF	17.0	0	14.3	41.1	43.5	32.6	33.6	18.3	16.0
Timber Lands Available Capable & Suitable	M Acres	554	0	196	473	542	453	466	209	227
Long-Term Sustained Timber Yield	MMCF	5.0	0	4.2	12.1	12.8	9.6	9.9	5.4	4.7
Energy Comsumption	Billion BTUs/ Decade	34								
Decade 1			12	37	58	60	43	45	40	35
Decade 3			7	31	92	97	53	59	35	30
Decade 5			7	36	116	120	73	73	36	33
Decade 10			7	34	106	108	71	75	35	36
Decade 15			8	44	59	59	76	78	34	39
Non Energy Minerals										
Category A	M Acres									
Low Potential			0	448	630	448	630	448	448	448
Moderate Potential			0	0	7	0	7	0	0	0
High Potential			0	0	0	0	0	0	0	0
Very High Potential			0	0	0	0	0	0	0	0
Total			0	448	637	448	637	448	448	448
Category B	M Acres									
Low Potential			0	328	328	328	328	328	328	328
Moderate Potential			0	0	0	0	0	0	0	0
High Potential			0	0	0	0	0	0	0	0
Very High Potential			0	0	0	0	0	0	0	0
Total			0	328	328	328	328	328	328	328

ALT F-1	ALT E-2	ALT F	ALT F (DEP)	ALT G (PREF)	ALT H	ALT I	ALT J	ALT K	MAX PNV
63.5	63.9	63.9	63.9	63.7	63.0	63.4	63.7	63.9	63.9
61.0	60.0	62.9	62.2	62.7	67.5	63.1	61.6	69.9	64.3
55.0	53.0	60.1	57.3	60.2	67.0	61.2	60.5	71.9	53.7
202	202	202	202	202	202	202	202	202	200
198	198	198	198	202	204	202	202	204	192
192	192	190	190	202	204	202	202	208	196
71.8	71.8	71.8	71.8	71.1	71.1	71.8	71.8	71.1	26.7
79.5	79.8	75.5	75.5	72.5	64.9	72.3	72.3	69.9	27.0
84.4	84.7	79.2	79.2	73.6	64.8	73.6	73.6	69.9	33.5
14.0 (4.1)	14.0 (4.1)	14.0 (4.1)	15.5 (4.6)	14.0 (4.1)	14.7 (4.3)	13.0 (3.8)	13.0 (3.8)	12.4 (3.6)	24.0 (7.1)
22.8 (6.7)	22.8 (6.7)	20.0 (5.9)	27.1 (8.0)	20.0 (5.9)	18.6 (5.5)	20.0 (5.9)	20.0 (5.9)	12.4 (3.6)	40.5 (11.9)
33.1 (9.7)	34.0 (10.1)	24.0 (7.1)	26.6 (7.8)	20.0 (5.9)	22.4 (6.6)	22.0 (6.5)	22.0 (6.5)	12.4 (3.6)	69.5 (20.4)
33.1 (9.7)	34.0 (10.1)	24.0 (7.1)	26.6 (7.8)	22.0 (6.5)	22.4 (6.6)	22.0 (6.5)	22.0 (6.5)	17.0 (5.0)	42.8 (12.6)
33.1 (9.7)	34.0 (10.1)	24.0 (7.1)	26.6 (7.8)	22.0 (6.5)	22.4 (6.6)	22.0 (6.5)	22.0 (6.5)	17.0 (5.0)	17.7 (5.2)
12.1 (3.6)	12.1 (3.6)	12.1 (3.6)	13.6 (4.0)	12.1 (3.6)	11.2 (3.3)	11.2 (3.3)	11.2 (3.3)	10.6 (3.1)	21.0 (6.2)
19.8 (5.8)	19.8 (5.8)	17.4 (5.1)	23.7 (7.0)	17.4 (5.1)	16.3 (4.8)	17.4 (5.1)	17.4 (5.1)	10.6 (3.1)	35.2 (10.3)
28.7 (8.4)	29.9 (8.8)	21.0 (6.2)	23.1 (6.8)	17.4 (5.1)	19.2 (5.7)	19.2 (5.7)	19.2 (5.7)	10.6 (3.1)	60.3 (17.7)
28.7 (8.4)	29.9 (8.8)	21.0 (6.2)	23.1 (6.8)	19.2 (5.7)	19.2 (5.7)	19.2 (5.7)	19.2 (5.7)	14.8 (4.3)	37.3 (11.0)
28.7 (8.4)	29.9 (8.8)	21.0 (6.2)	23.1 (6.8)	19.2 (5.7)	19.2 (5.7)	19.2 (5.7)	19.2 (5.7)	14.8 (4.3)	15.4 (4.5)
34.6	38.8	25.4	26.8	23.8	23.7	20.3	20.3	14.4	43.8
443	534	286	309	282	255	281	281	202	640
10.2	11.7	7.5	7.7	7.0	7.0	6.0	6.0	4.0	12.9
43	44	41	50	38	39	37	37	34	80
59	70	43	67	48	44	47	46	30	120
91	107	56	68	47	58	48	47	28	210
86	96	55	62	54	57	52	54	41	125
88	83	47	48	43	34	31	46	36	50
630	448	448	448	436	927	619	463	772	384
7	0	0	0	0	122	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
637	448	448	448	436	1049	619	463	772	384
328	328	328	328	340	203	245	362	203	392
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
328	328	328	328	340	203	245	362	203	392

RESOURCE	UNIT OF MEASURE	1984	MIN LEVEL	CURRENT DIRECTION	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D
Category C	M Acres									
Low Potential			0	165	160	165	160	165	165	165
Moderate Potential			0	32	30	32	30	32	32	32
High Potential			0	0	0	0	0	0	0	0
Very High Potential			0	0	0	0	0	0	0	0
Total			0	197	190	197	190	197	197	197
Category D	M Acres									
Low Potential			0	705	525	705	525	705	705	705
Moderate Potential			0	130	128	130	128	130	130	130
High Potential			0	30	30	30	30	30	30	30
Very High Potential			0	5	5	5	5	5	5	5
Total			0	870	688	870	688	870	870	870
Energy Minerals										
Category A	M Acres									
Low Potential			0	0	129	0	129	0	0	0
Moderate Potential			0	0	55	0	55	0	0	0
High Potential			0	0	0	0	0	0	0	0
Very High Potential			0	448	448	448	448	448	448	448
Total			0	448	632	448	632	448	448	448
Category B	M Acres									
Low Potential			0	0	0	0	0	0	0	0
Moderate Potential			0	0	0	0	0	0	0	0
High Potential			0	0	0	0	0	0	0	0
Very High Potential			0	328	328	328	328	328	328	328
Total			0	328	328	328	328	328	328	328
Category C	M Acres									
Low Potential			0	193	0	0	146	193	658	193
Moderate Potential			0	55	0	0	14	55	80	55
High Potential			0	0	0	0	0	0	0	0
Very High Potential			0	0	0	0	0	0	0	0
Total			0	248	0	0	160	248	738	248
Category D	M Acres									
Low Potential			0	766	830	959	684	766	292	766
Moderate Potential			0	53	53	108	39	53	37	53
High Potential			0	0	0	0	0	0	0	0
Very High Potential			0	0	0	0	0	0	0	0
Total			0	819	883	1067	723	819	329	819
Roads & Trails										
Arterial & Collector To Be Repaired Or Constructed	Miles	4.5								
Decade 1			0	4.5	4.2	5.2	4.5	4.5	4.5	4.5
Decade 2			0	1.4	5.5	5.7	3.9	4.8	4.9	4.9
Decade 3			0	3.8	13.7	12.0	4.9	7.8	3.0	3.0
Decade 5			0	5.1	17.9	19.1	5.4	10.1	3.8	3.8
Decade 10			0	3.0	10.6	11.3	3.2	6.0	2.2	2.2
Decade 15			0	1.8	.0	.0	1.9	3.5	1.3	1.3
Local To Be Constructed	Miles	10.0								
Decade 1			0	12.5	21.0	22.9	16.2	17.6	15.3	10.7
Decade 2			0	10.3	28.8	29.0	18.0	20.6	10.4	13.0
Decade 3			0	8.1	25.5	31.2	17.0	19.1	12.5	8.4
Decade 5			0	10.7	33.8	36.1	29.3	24.8	12.0	10.2
Decade 10			0	10.5	32.1	32.5	29.5	30.4	13.1	14.0
Decade 15			0	20.9	.0	.0	35.3	36.4	13.1	17.5
Trail Construction & Reconstruction	Miles	0	0	0	1.5	1.5	.8	0	2.0	2.0

ALT E-1	ALT E-2	ALT F	ALT F (DEP)	ALT G (PREF)	ALT H	ALT I	ALT J	ALT K	MAX PNV
160	165	165	165	165	142	151	158	150	165
30	32	32	32	32	6	32	32	32	32
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
190	197	197	197	197	148	183	190	182	197
525	705	705	705	705	376	631	663	521	705
128	130	130	130	130	32	130	130	130	130
30	30	30	30	30	30	30	30	30	30
5	5	5	5	5	5	5	5	5	5
688	870	870	870	870	443	796	828	686	870
55	0	0	0	0	395	89	50	183	0
129	0	0	0	0	80	0	0	15	0
0	0	0	0	0	0	0	0	0	0
448	448	448	448	436	573	531	413	573	384
632	448	448	448	436	1048	620	463	771	384
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
328	328	328	328	340	203	245	363	203	394
328	328	328	328	340	203	245	363	203	394
0	0	193	193	142	118	510	549	206	0
0	0	55	55	55	4	70	74	41	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	248	248	197	122	580	623	247	0
829	958	766	766	817	270	361	361	572	822
54	109	53	53	53	20	37	33	50	243
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
883	1067	819	819	870	290	398	394	622	1065
4.5	4.5	4.5	5.2	3.6	3.6	3.6	3.6	1.7	5.2
3.2	4.5	5.0	5.1	1.4	1.4	1.4	1.4	1.8	18.8
5.2	11.0	2.2	8.1	2.4	2.4	1.3	1.3	1.4	28.2
6.5	17.4	4.8	10.1	2.0	2.0	2.5	2.0	1.4	47.0
3.8	10.3	3.1	6.0	2.4	2.4	2.0	2.4	3.1	17.3
.0	6.1	5.0	3.5	1.9	1.8	.0	1.9	1.0	.0
16.0	17.1	14.1	19.8	13.0	13.0	12.9	12.9	12.4	26.1
16.5	16.9	12.3	22.5	12.2	12.4	12.2	12.2	8.4	30.5
19.1	22.5	11.3	18.0	15.2	13.7	15.2	15.0	9.3	37.4
33.2	34.8	14.6	17.7	14.8	21.7	13.2	12.9	7.8	57.9
31.1	32.2	16.2	16.7	18.8	20.1	17.2	18.5	13.1	24.5
.0	24.4	6.8	6.0	8.6	.0	11.4	12.3	9.8	9.3
2.0	1.8	2.0	2.0	10.0	5.0	5.0	5.0	2.0	0

RESOURCE	UNIT OF MEASURE	1984	MIN LEVEL	CURRENT DIRECTION	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D
Forest Generated Private Sector Employment	Jobs									
Decade 1			700	946	1132	1132	970	969	947	947
Decade 2			625	978	1204	1210	986	1069	978	980
Decade 5			946	1521	2109	2109	1775	1749	1515	1538
Forest Generated Private Sector Income	MM$/Yr									
Decade 1			13.72	16.69	18.13	18.13	16.99	16.96	16.70	16.80
Decade 2			6.52	16.93	19.77	19.82	17.66	18.26	16.84	17.43
Decade 5			13.70	25.33	32.38	32.30	28.63	28.56	25.29	25.37
Wildlife/Habitat Imp/T&E Imp. (F.S. Costs)	MM$/Yr									
Decade 1			.0039	.0770	.2098	.2294	.0727	.0756	.2256	.0763
Decade 2			.0039	.0770	.2098	.2292	.0719	.0749	.2255	.0762
Decade 3			.0039	.0770	.2096	.2298	.0719	.0747	.2255	.0760
Decade 5			.0039	.0771	.2058	.2273	.0698	.0731	.2257	.0737
Decade 10			.0039	.0774	.1968	.2201	.0694	.0742	.2267	.0742
Decade 15			.0039	.0784	.1983	.2202	.0696	.0742	.2271	.0748
Range Costs (F.S. Costs)	MM$/Yr									
Decade 1			.0009	.3674	.4333	.4368	.4054	.4075	.3820	.4046
Decade 2			.0009	.4367	.4975	.5001	.4650	.4613	.4533	.4663
Decade 3			.0009	.4365	.4954	.4987	.4753	.4669	.4501	.4671
Decade 5			.0009	.4365	.5776	.5775	.5038	.4987	.4502	.5543
Decade 10			.0009	.4388	.5894	.5991	.4931	.4935	.4457	.5618
Decade 15			.0009	.4391	.5807	.6004	.4898	.4852	.4387	.5589
Timber Costs (F.S. & Non F.S. Costs)	MM$/Yr									
Decade 1			0.00	3.12	4.93	5.28	3.46	3.63	3.12	3.29
Decade 2			0.00	3.71	10.57	10.57	6.44	6.76	3.71	3.71
Decade 3			0.00	4.07	12.69	14.51	7.91	9.19	4.08	4.26
Decade 5			0.00	4.74	17.39	18.63	10.92	11.24	4.82	4.84
Decade 10			0.00	5.60	19.35	20.73	15.22	15.43	6.84	7.45
Decade 15			0.00	5.98	17.37	19.07	15.88	16.16	7.04	7.74
Other Costs (F.S. Costs)	MM$/Yr									
Decade 1			2.67	2.81	3.40	3.12	3.00	2.95	2.97	2.89
Decade 2			2.59	2.73	3.40	2.30	2.79	2.78	2.84	2.81
Decade 3			2.59	2.73	3.40	3.20	2.80	2.80	2.88	2.89
Decade 5			2.59	2.73	4.00	3.30	2.83	2.85	2.88	2.91
Decade 10			2.59	2.82	4.30	3.30	2.86	2.86	2.88	2.92
Decade 15			2.59	2.82	2.82	3.30	2.87	2.87	2.90	2.92
Capital Investment Road Costs (F.S. Costs)	MM$/Yr									
Decade 1			.00	.20	.30	.31	.20	.20	.20	.20
Decade 2			.00	.07	.53	.54	.26	.29	.11	.46
Decade 3			.00	.25	1.19	1.07	.30	.50	.10	.51
Decade 5			.00	.34	1.64	1.60	.40	.64	.13	.67
Decade 10			.00	.23	.74	.72	.25	.37	.07	.17
Decade 15			.00	.12	.45	.43	.15	.23	.05	.11
Purchasher Credit Road Costs (Non-F.S. Costs)	MM$/Yr									
Decade 1			.00	.44	.59	.69	.46	.51	.44	.49
Decade 2			.00	.35	.97	.97	.60	.73	.36	.35
Decade 3			.00	.33	1.44	1.44	.70	.98	.31	.29
Decade 5			.00	.49	2.57	2.02	1.36	1.20	.57	.55
Decade 10			.00	.47	1.76	1.82	1.62	1.49	.65	.66
Decade 15			.00	1.26	0.00	0.00	2.60	2.33	.77	1.09

ALT E-1	ALT E-2	ALT F	ALT F (DEP)	ALT G (PREF)	ALT H	ALT I	ALT J	ALT K	MAX PNV
962	959	969	980	953	1026	966	1061	960	1040
1052	1051	1037	1069	1029	1063	1042	1140	968	1185
1943	1924	1781	1717	1650	1644	1720	1753	1506	2196
16.96	16.98	16.95	17.16	16.78	18.02	17.00	18.42	16.81	18.29
18.10	18.16	17.91	18.42	17.73	18.28	17.97	19.41	16.97	20.06
30.98	30.82	28.64	28.00	27.10	28.09	29.25	29.72	23.85	35.10
.1255	.1286	.1208	.1195	.1197	.0833	.1200	.1192	.1471	.0221
.1254	.1286	.1207	.1193	.1197	.0832	.1200	.1192	.1471	.0221
.1252	.1283	.1199	.1193	.1197	.0829	.1199	.1192	.1471	.0221
.1223	.1241	.1190	.1194	.1195	.0826	.1198	.1190	.1471	.0228
.1211	.1227	.1193	.1198	.1194	.0730	.1191	.1183	.1469	.0228
.1213	.1129	.1183	.1192	.1186	.0733	.1183	.1175	.1449	.0228
.4059	.4076	.7409	.7439	.3867	.2929	.3033	.3030	.3207	.2187
.4719	.4695	.8991	.8961	.4046	.3497	.4017	.4024	.3755	.2341
.4703	.4695	.9048	.8958	.4125	.3494	.4097	.4104	.3751	.2292
.5360	.5397	.9206	.9007	.4193	.3494	.4166	.4173	.3754	.2417
.5379	.5301	.9269	.9328	.4196	.3874	.4174	.4181	.3941	.1906
.5381	.5269	.9107	.9198	.4204	.3773	.4183	.4190	.3973	.1965
3.41	3.79	3.71	4.58	3.77	3.89	3.48	3.55	3.30	7.23
6.00	6.34	5.64	7.06	5.30	5.15	5.28	5.26	3.82	11.07
8.82	10.89	7.47	10.28	6.84	6.49	6.83	6.81	4.22	16.69
15.29	16.66	9.07	11.15	7.91	9.14	8.29	8.26	4.83	30.17
17.97	20.33	10.33	10.16	9.26	11.91	9.55	9.56	6.83	20.52
15.31	19.44	7.63	7.05	8.94	10.94	9.57	9.59	6.65	6.41
3.01	3.00	3.05	3.05	3.00	2.97	2.00	2.90	2.96	2.74
2.84	2.83	2.98	3.01	2.96	2.90	2.02	2.91	2.88	2.67
2.98	2.91	2.98	3.01	2.96	2.37	2.03	2.91	2.88	2.67
2.95	3.02	3.00	3.01	3.08	2.90	2.03	2.90	2.88	3.51
2.96	3.03	3.01	3.01	3.05	2.90	2.04	2.90	2.87	2.98
2.96	3.04	3.24	3.30	2.96	2.90	2.03	2.90	2.88	7.39
.20	.20	.20	.30	.15	.15	.15	.15	.11	.60
.23	.32	.35	.65	.24	.24	.24	.24	.12	1.00
.47	.85	.41	1.10	.45	.45	.45	.45	.11	1.50
.49	1.22	.63	1.43	.55	.55	.55	.55	.13	2.50
.27	.70	.09	.62	.18	.17	.17	.18	.22	.70
.16	.42	.06	.38	.15	.14	.15	.15	.08	.60
.45	.48	.57	.75	.46	.38	.43	.43	.42	.71
.56	.58	.58	1.38	.41	.42	.41	.41	.29	1.02
.72	1.12	.68	1.58	.57	.53	.57	.57	.36	1.59
1.62	1.60	1.37	1.24	.55	1.01	.60	.57	.34	3.70
2.30	1.85	.78	.76	.72	1.26	.76	.83	.64	.58
0.00	1.64	.42	.31	.47	0.00	.73	.79	.54	.49

RESOURCE	UNIT OF MEASURE	1984	MIN LEVEL	CURRENT DIRECTION	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D
Total F.S. Costs (Budget)	MM$/Yr									
Decade 1			2.67	3.89	4.98	4.82	4.10	4.16	4.11	4.07
Decade 2			2.60	3.69	5.68	5.29	4.22	4.32	4.05	4.19
Decade 3			2.60	3.84	6.65	6.26	4.32	4.67	4.00	4.28
Decade 5			2.60	4.03	8.51	7.42	5.00	5.24	4.18	4.71
Decade 10			2.60	3.99	7.49	6.70	4.98	5.10	4.18	4.33
Decade 15			2.60	3.96	5.68	5.99	4.87	4.95	4.15	4.28
Non-Forest Service Costs	MM$/Yr									
Decade 1			0.00	3.13	4.88	5.25	3.45	3.61	3.13	3.28
Decade 2			0.00	3.69	10.50	10.50	6.41	6.77	3.70	3.69
Decade 3			0.00	4.05	12.73	14.63	7.94	9.34	4.05	4.21
Decade 5			0.00	4.79	18.07	18.93	11.09	11.26	4.90	4.89
Decade 10			0.00	5.61	19.44	20.71	15.55	15.63	6.94	7.51
Decade 15			0.00	6.74	15.74	17.65	17.10	17.20	7.25	8.22
Total Costs	MM$/Yr									
Decade 1			2.67	7.02	9.89	10.07	7.55	7.77	7.24	7.34
Decade 2			2.60	7.38	16.18	15.79	10.62	11.10	7.74	7.88
Decade 3			2.60	7.89	19.38	20.89	12.26	14.01	8.05	8.49
Decade 5			2.60	8.83	26.57	26.35	16.08	16.50	9.08	9.60
Decade 10			2.60	9.60	26.93	27.40	20.53	20.73	11.12	11.84
Decade 15			2.60	10.70	21.42	23.64	22.06	22.14	11.40	12.50
Market Resource Benefits	MM$/Yr									
Decade 1			.396	.826	.986	.986	.856	.856	.816	.816
Decade 2			.396	.896	1.396	1.396	1.056	1.056	.886	.886
Decade 3			.396	.956	1.676	1.676	1.206	1.206	.946	.966
Decade 5			.396	1.066	2.266	2.266	1.526	1.526	1.046	1.076
Decade 10			.396	1.066	2.266	2.266	1.526	1.526	1.046	1.076
Decade 15			.396	1.066	2.266	2.266	1.526	1.526	1.046	1.076
Non-Market Resource Benefits	MM$/Yr									
Decade 1			0	64.3	67.2	63.5	67.6	63.9	64.5	64.5
Decade 2			0	73.1	76.1	70.9	76.8	71.8	73.4	73.1
Decade 3			0	81.4	84.0	77.2	85.2	78.9	81.9	81.3
Decade 5			0	97.2	97.9	90.0	100.4	93.1	98.0	98.6
Decade 10			0	118.5	115.1	107.3	120.2	111.6	119.4	120.8
Decade 15			0	118.5	115.1	107.3	120.2	111.6	119.4	120.8
Range Returns	MM$/Yr									
Decade 1			0	.13	.13	.13	.13	.13	.13	.13
Decade 2			0	.13	.14	.14	.14	.13	.13	.13
Decade 3			0	.13	.15	.15	.14	.14	.13	.15
Decade 5			0	.13	.16	.16	.15	.15	.13	.16
Decade 10			0	.13	.16	.16	.15	.15	.13	.16
Decade 15			0	.13	.16	.16	.15	.15	.13	.16
Timber Returns	MM$/Yr									
Decade 1			0	.3	.46	.46	.33	.33	.29	.29
Decade 2			0	.37	.86	.86	.52	.52	.36	.36
Decade 3			0	.43	1.13	1.13	.67	.67	.42	.42
Decade 5			0	.54	1.71	1.71	.98	.98	.52	.52
Decade 10			0	.54	1.71	1.71	.98	.98	.52	.52
Decade 15			0	.54	1.71	1.71	.98	.98	.52	.52
Oil & Gas Returns Same For All Decades	MM$/Yr		.336	.336	.336	.336	.336	.336	.336	.336
Other Returns Same For All Decades	MM$/Yr		.06	.06	.06	.06	.06	.06	.06	.06

ALT E-1	ALT E-2	ALT F	ALT F (DEP)	ALT G (PREF)	ALT H	ALT I	ALT J	ALT K	MAX PNV
4.21	4.23	4.62	4.94	4.35	4.14	4.17	4.18	4.13	4.49
4.26	4.35	4.90	5.62	4.45	4.24	4.36	4.36	4.03	5.00
4.77	5.32	5.16	6.08	4.80	4.65	4.69	4.69	4.02	6.07
5.62	6.49	5.61	6.40	5.15	5.25	4.99	4.98	4.09	8.62
5.52	6.12	4.98	5.60	4.85	5.03	4.67	4.71	4.41	5.28
4.92	5.52	5.04	5.36	4.83	4.80	4.80	4.78	4.27	4.62
3.39	3.59	3.51	4.61	3.53	3.63	3.29	3.28	3.13	7.03
5.96	6.07	5.40	7.49	4.98	4.90	4.99	4.98	3.60	11.01
8.84	10.43	7.12	10.91	6.56	6.15	6.59	6.57	4.08	16.63
15.38	15.86	8.63	11.45	7.48	8.77	7.89	7.84	4.61	31.53
18.64	19.26	9.89	10.01	8.90	11.66	9.25	9.28	6.71	19.72
14.18	18.59	7.26	6.67	8.23	9.62	9.08	9.18	6.42	10.55
7.61	7.81	8.13	9.54	7.88	7.77	7.46	7.46	7.26	11.52
10.22	10.42	10.29	13.12	9.43	9.14	9.35	9.34	7.63	16.01
13.61	15.75	12.28	16.98	11.36	10.27	11.28	11.26	8.09	22.69
21.00	22.35	14.24	17.85	12.63	14.02	12.87	12.83	8.70	40.15
24.16	25.38	14.87	15.60	13.75	16.69	13.92	14.00	11.12	25.00
19.10	24.11	12.29	12.03	13.06	14.42	13.88	13.97	10.69	15.16
.856	.856	.856	.946	.828	.854	.828	.828	.814	1.004
1.016	1.016	1.016	1.206	1.014	.940	1.014	1.014	.882	1.345
1.286	1.286	1.206	1.596	1.192	1.132	1.192	1.192	.939	1.794
1.916	1.956	1.536	1.836	1.443	1.446	1.401	1.401	1.043	3.316
1.916	1.956	1.536	1.836	1.443	1.446	1.401	1.401	1.234	2.236
1.916	1.956	1.536	1.836	1.443	1.446	1.401	1.401	1.234	1.193
67.5	63.8	64.2	63.5	63.3	67.8	64.8	64.6	65.5	60.5
76.5	71.5	72.6	70.9	73.3	77.1	74.0	73.7	74.7	67.2
84.7	78.5	80.3	77.1	82.1	82.4	82.8	82.4	83.3	72.5
98.0	89.7	96.3	90.9	99.8	102.8	100.7	100.0	99.7	86.9
116.0	106.7	119.5	112.8	123.9	126.2	124.9	124.1	121.1	101.2
116.3	106.7	119.5	112.8	123.9	126.2	124.9	124.1	121.1	99.6
.13	.13	.13	.13	.13	.117	.128	.128	.126	.048
.13	.13	.13	.13	.13	.117	.13	.13	.126	.049
.14	.14	.14	.14	.13	.117	.13	.13	.126	.048
.15	.15	.14	.14	.13	.117	.132	.132	.126	.060
.15	.15	.14	.14	.13	.117	.132	.132	.126	.060
.15	.15	.14	.14	.13	.117	.132	.132	.126	.060
.33	.33	.33	.42	.302	.341	.302	.302	.288	.560
.49	.49	.49	.68	.488	.477	.488	.488	.356	.9
.75	.75	.67	1.06	.666	.619	.666	.666	.413	1.35
1.37	1.41	1.00	1.30	.917	.933	.875	.875	.517	2.86
1.37	1.41	1.00	1.30	.917	.933	.875	.875	.708	1.78
1.37	1.41	1.00	1.30	.917	.933	.875	.875	.708	.737
.336	.336	.336	.336	.336	.336	.336	.336	.336	.336
.06	.06	.06	.06	.06	.06	.06	.06	.06	.06

RESOURCE	UNIT OF MEASURE	1984	MIN LEVEL	CURRENT DIRECTION	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D
Returns To U.S. Treasury	MM$/Yr									
Decade 1			.40	1.19	1.72	1.94	1.27	1.39	1.19	1.33
Decade 2			.40	1.72	3.96	3.96	2.61	2.76	1.71	1.73
Decade 3			.40	2.31	5.21	7.42	3.92	5.21	2.33	2.74
Decade 5			.40	4.26	11.92	14.63	9.12	9.88	4.32	4.43
Decade 10			.40	5.63	18.16	17.71	13.89	14.27	6.71	7.36
Decade 15			.40	4.50	18.03	19.96	10.81	11.36	5.68	5.81
Returns To State	MM$/Yr									
Decade 1			.10	.47	.67	.76	.50	.55	.47	.53
Decade 2			.10	.57	1.37	1.37	.89	.98	.57	.57
Decade 3			.10	.70	1.82	2.38	1.24	1.65	.70	.79
Decade 5			.10	1.05	3.13	3.25	2.13	2.16	1.11	1.11
Decade 10			.10	1.58	5.14	5.70	4.03	4.09	1.91	2.08
Decade 15			.10	1.50	4.65	5.25	3.50	3.57	1.67	1.80
Costs Discounted At 4%	MM$									
Wild. Hab. Imp.			.01	1.95	5.25	5.76	1.81	1.88	4.71	1.91
Range			.00	10.53	12.81	12.87	11.65	11.56	10.90	12.04
Timber			.00	100.60	284.90	300.54	189.97	199.48	105.15	109.59
Roads			.00	5.33	15.35	15.20	6.90	9.48	5.80	5.80
Other			77.30	81.28	82.62	111.72	91.50	92.70	85.35	90.43
Benefits Discounted At 4%	MM$									
Rec.(including hunting)			194.20	205.10	209.80	195.10	213.40	199.20	206.00	206.00
Range			.02	20.52	22.22	22.35	21.79	21.91	20.30	12.39
Timber			.00	156.05	448.57	484.05	308.43	328.53	165.55	174.73
Other			10.09	0.63	1.24	1.40	0.81	0.66	1.34	11.13
Present Value Ben. Without Non F.S. Logging Benefits At 4%	MM$		204.31	292.01	458.15	435.81	374.16	372.26	299.22	304.55
Present Value Costs Without Non F.S. Logging Costs At 4%	MM$		77.31	109.39	177.76	179.01	131.54	137.06	118.92	120.08
Present Net Value (4%)	MM$		127.00	182.62	280.89	256.80	242.62	235.20	180.30	184.47
Opportunity Cost (4%)	MM$		180.96	125.39	27.12	51.21	65.40	72.81	127.71	123.54
Benefit/Cost Ratio (4%)	MM$		2.64	2.67	2.58	2.43	2.84	2.72	2.52	2.54
Present Value Benefit Without Non F.S. Logging At 7 1/8%	MM$		98.41	143.75	191.54	192.90	169.64	169.02	144.91	148.00
Present Value Cost Without Non F.S. Logging At 7 1/8%	MM$		37.59	61.51	98.23	91.92	69.37	72.49	67.56	67.42
Present Net Value (7 1/8%)	MM$		60.82	82.24	93.31	101.61	100.27	96.54	77.35	80.58
Recommended Research Natural Areas	Acres		3281	3281	3281	3281	3281	3281	3281	3281
Forest Work Force	Work-Year Equivalents		125.90	183.42	234.82	227.27	193.32	196.15	193.79	191.91

ALT E-1	ALT E-2	ALT F	ALT F (DEP)	ALT G (PREF)	ALT H	ALT I	ALT J	ALT K	MAX PNV
1.31	1.43	1.19	1.35	1.27	1.47	1.23	1.24	1.19	1.99
2.48	2.56	1.54	1.99	2.23	2.20	2.25	2.27	1.81	3.52
4.40	5.70	2.27	4.18	3.17	3.09	3.22	3.25	2.23	2.83
12.04	14.36	7.42	8.40	7.06	7.45	7.39	7.47	4.48	19.63
16.36	18.90	9.18	9.81	8.32	10.22	8.66	8.57	6.40	22.19
15.21	16.83	6.43	6.08	7.41	11.19	7.71	7.66	5.78	35.41
.51	.55	.51	.64	.51	.53	.49	.49	.47	.88
.84	.87	.70	.99	.73	.72	.73	.74	.57	1.37
1.37	1.83	1.03	1.56	1.03	.98	1.03	1.03	.70	1.94
3.59	3.98	2.17	2.53	1.98	2.24	2.07	2.08	1.25	6.49
4.84	5.06	2.59	2.75	2.36	2.98	2.45	2.45	1.83	6.36
4.29	4.49	1.79	1.67	2.08	2.89	2.20	2.21	1.63	9.14
3.15	3.22	3.04	3.02	3.05	2.08	3.03	3.01	3.72	0.35
11.94	11.92	21.69	21.59	10.21	8.45	9.48	9.49	9.08	6.78
117.30	236.04	147.04	199.23	165.80	160.54	152.10	152.81	163.63	409.85
6.96	13.34	4.54	14.75	3.46	3.42	3.46	3.46	3.26	30.12
172.35	86.40	102.10	91.20	77.52	91.84	92.19	91.21	83.85	113.07
210.90	196.10	203.80	196.60	207.70	215.30	209.50	208.40	209.40	185.80
21.71	22.43	21.02	21.07	20.30	18.43	19.82	19.82	19.93	8.13
340.18	374.58	238.83	307.36	230.75	244.89	233.52	233.63	163.65	672.73
1.31	0.29	64.80	34.34	17.05	12.19	16.76	16.96	15.43	1.51
400.72	391.58	358.70	398.58	345.05	352.67	347.57	347.15	314.95	496.55
138.31	149.10	135.66	168.98	129.28	128.20	128.19	128.29	114.81	188.54
262.41	242.48	223.04	229.60	215.77	224.47	219.37	218.86	200.14	308.01
45.60	65.53	84.97	78.41	92.22	83.53	88.64	89.15	107.87	.00
2.89	2.63	2.64	2.36	2.67	2.75	2.71	2.71	2.74	2.63
172.62	172.63	165.50	166.40	164.21	166.04	164.24	164.23	154.27	204.73
71.75	71.06	77.15	92.04	70.19	68.43	69.33	71.58	63.85	92.09
100.87	101.30	88.41	74.36	93.78	97.60	94.91	92.66	90.41	112.70
3281	3281	3281	3281	3281	3281	3281	3281	3281	3281
198.51	199.45	217.84	232.93	205.11	195.21	196.62	197.10	194.74	211.71

View of Elk Calving and Wintering Range, North Fork Sun River.

FEIS

Chapter III
Affected Environment

Overview

The Affected Environment describes the physical, biological, social, and economic environments that would affect or would be affected by the alternatives. The first part gives a general description of the Forest. The last part describes the resources and social and economic environments. The Affected Environment was updated in April, 1985, to reflect the lastest available information. Additional information from the DEIS and DEIS-Supplement has been added. This includes information on:

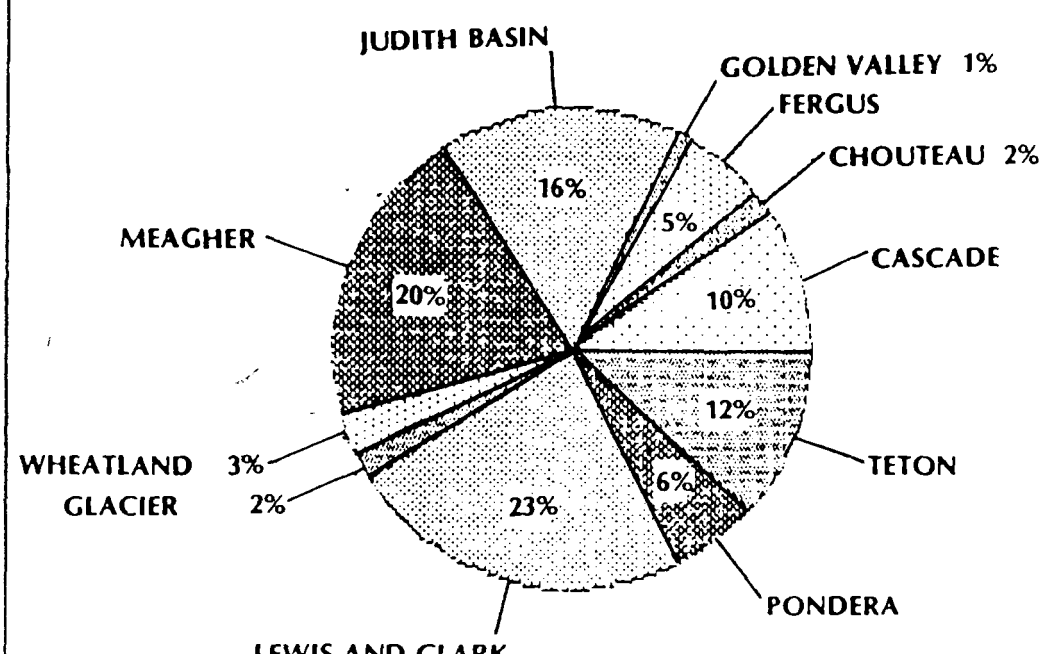
- Vegetation
- Visual Setting
- Cultural Properties
- Wildlife and Fish
- Noxious Weed Control
- Range - Demand
- Timber Harvest
- Water
- Air
- Hydrocarbon Potential
- Minerals - Withdrawal Review and Other Rights
- Fire Management
- Law Enforcement

GENERAL DESCRIPTION

FOREST ACREAGE	The gross area within the boundaries of the Lewis and Clark National Forest is 1,999,022 acres (National Forest System Areas Report, FY 1982). Approximately 1,843,397 acres are administered by the Forest Service in large consolidated blocks. Figure 3.1 shows the percentage of National Forest acres by county.
Private Land	Private lands account for 155,625 acres of the gross area. The west edge of the Little Belt Mountains and the north side of the Crazy Mountains contain large areas of intermingled private lands. These private lands, together with smaller tracts scattered within the boundary, resulted from early day homesteads, patented mining claims, and railroad grants. Currently recreation, hay production, livestock grazing, timber management, mining, and residential development are major uses of these tracts.

FIGURE 3.1

Percentage of National Forest by County



<.2% SWEETGRASS COUNTY <.1% PARK COUNTY

GENERAL DESCRIPTION

GENERAL TOPOGRAPHY

Topography varies from the steep, rugged, and precipitous slopes of the Rocky and Big Snowy Mountains to the gently rolling, and broad plateaus of the Castles and Little Snowy Mountains. Elevations vary from 9,362 feet in the Rocky Mountains to 4,500 feet in the Lower Deep Creek-Smith River area of the Little Belt Mountains.

Jefferson Division

Jefferson Division mountain ranges are dome-like with smooth, rounded tops flanked by valleys. The Big Snowies, Little Snowies, and eastern end of the Castle Mountains were formed from uplifted, tilted limestone beds.

The west end of the Castle Mountains were formed by a dome of intrusive igneous rock injected into older, uplifted limestone beds. The Castle's surface topography is largely due to frost and water erosion.

The Crazy and Highwood Mountains consist of volcanic rock. The Little Belt Mountains have an igneous rock core; sandstone, limestone, and shale are exposed on the higher ridges. The north and south facing slope of the Little Belts are uplifted and tilted limestone beds.

Rocky Mountain Division

Locally, the Rocky Mountains resulted from extensive overthrusting and faulting of sedimentary rock. They have very steep ridges and narrow valleys consisting of alternating layers of hard limestone, or dolomite, and softer sandstone and shale. The dolomite forms the ridges, with the softer shales and sandstones underlying the valleys. The spectacular peaks and steep ridges are the result of alpine glaciation. The gently rolling topography in the valleys of the Two Medicine River is partially due to the scouring action of glaciers.

CLIMATE

The Forest's climate varies from cool and semi-arid to cold and humid. Precipitation ranges from 14 inches annually on the lower slopes of the Jefferson Division to 65 inches on the highest ridges in the Rockies. 50 to 80 percent of this moisture occurs as snow. The growing season for native plants is limited by moisture on low elevation lands and by cold temperatures at higher elevations. On low elevation lands, plant growth begins in late April or early May and ends in mid-August. On high elevation lands, plant growth begins in late May or early June and ends in late August. An important climatic factor at all elevations is the frequent strong winds. Chinook winds during the winter cause dramatic temperature changes, as much as 50 degrees in one hour.

GENERAL DESCRIPTION

VEGETATION

Eight-five percent of the Forest is covered by trees. The remaining fifteen percent contains many beautiful grassy parks and mountain meadows plus numerous rocky ridges and peaks.

As one approaches the Forest boundary, the grassland communities reflect the moisture available for plant growth. The driest sites support communities dominated by bunchgrass and sagebrush. Slightly moister sites support communities dominated by fescue and sagebrush. On still moister sites the sagebrush is absent.

As one moves onto the Forest, lower elevations are dominated by Douglas fir with small grassland parks on exposed ridges or steep south-facing slopes. Limber pine and ponderosa pine are commonly found mixed with the Douglas fir. Lodgepole pine grows only on the moistest sites.

Mid areas are dominated by lodgepole pine forest. Aspen, Douglas fir and spruce also are found. Grasslands occupy upland parks, creek bottom stringer and steep south- or west- facing slopes.

High elevations are severely affected by the wind. Trees tend to be shorter than normal at maturity, big boled, with dense limbs extending to the ground. Lodgepole pine grows, but is always mixed with stands of whitebark pine, spruce, Douglas fir and alpine fir. Grasslands include alpine meadows along the high ridges and grass parks at lower elevations.

Fire is the primary natural force defining the vegetative patterns of the Forest. Fire is also the agent that maintains the long-term energy balance in the ecosystem. Fire has been vigorously suppressed through the recent history of the Forest. A program of natural fire management in wilderness is designed to allow fire to resume its natural role of regulating plant diversity. Throughout the remainder of the Forest timber harvest and prescribed fire have become the major factors influencing the Forest's plant communities.

There are no known occurrences on the Forest of plants classified, or proposed for classification, as threatened or endangered under the Endangered Species Act of 1973. However, there are plants of limited distribution, often far from their normal range of occurrence. These plants are considered worthy of protection, even though they have no legal status under the Endangered Species Act.

GENERAL DESCRIPTION

VISUAL SETTING

The beauty of a tree-covered mountainside or meadows interspersed with trees is one of many assets to be found in the forested mountains of the Lewis and Clark. Each mountain range has its own unique visual setting.

The spectacular peak and reefs of the Rocky Mountains reflect alpine glaciation which has carved the many valleys which bisect the mountains.

The Highwood Mountains, are a mosaic of timber, meadow, and rock. This range is a small rectangular cluster of mountains with steep slopes.

The rounded, tree covered Little Belt Mountains spread out from its divide into numerous dry, rocky canyons.

The Castle Mountains is a small and low group of mountains, with foothills in the east and a cluster of 8,000 foot mountains in the west. The most noticeable features are the castle-like igneous spires which stand up to 50 feet.

The Crazy Mountains are an isolated range which rises abruptly from rolling ranch lands. The peaks have been deeply carved by past glacial action and present a jagged, rocky profile.

The Big Snowy Mountains are thrusted to elevations over 8,600 feet from the surrounding 5,000 foot plains. The mountains form a flattopped ridge surrounded by cirque like basins.

The adjacent Little Snowy Mountains are small hills covered with ponderosa pine.

BLACKFEET TREATY RIGHTS

The northern part of the Rocky Mountain District was once a part of the Blackfeet Indian Reservation. The Blackfeet Indian Nation retains certain rights on these lands under the Treaty Rights Agreement of 1896. "Provided, that said Indians shall have, and do hereby reserve to themselves, the right to go upon any portion of the lands hereby conveyed so long as the same shall remain public lands of the United States, and to cut and remove therefrom wood and timber for agency and school purposes, and for their personal uses for houses, fences, and all other domestic purposes: And Provided Further, that said Indians hereby reserve and retain the right to

hunt upon said lands and to fish in the streams thereof so long as the same shall remain public lands of the United States under and in accordance with the provisions of the game and fish laws of the State of Montana." - Article I, Agreement with the Indians of the Blackfeet Indian Reservation in Montana 29 Stat. 321, 353-354 (1896).

TENDERFOOT EXPERIMENTAL FOREST

In 1961, the 9,125 acre Tenderfoot Experimental Forest in the Little Belt Mountains, was established. In the 1960s, a research project to develop lodgepole pine harvesting techniques while maintaining soil stability was proposed. The research also would provide methods for improving water yields without aggravating snowmelt, summer storms, and sediment production.

In 1978, a research proposal to study "multiple resource management of eastside subalpine forest lands in Montana" was made. In 1980, an additional proposal was made to conduct research to "improve our ability to assess, predict, and control non-point pollution from Forest operations." Since establishment of the Experimental Forest, development has been minimal. These three projects have not been funded.

RESEARCH NATURAL AREAS

Research natural areas are ecological reference points or experimental controls. By studying the natural areas it is possible to measure and assess the results of our management activities. Research natural areas also serve as field laboratories and "store houses" of genetic diversity. One area, Paine Gulch near Monarch in the Little Belts, has been recommended as a research natural area.

AFFECTED RESOURCES

RECREATION

The number of recreation facilities and types of recreation settings in each alternative affect the social and economic environment within the Forest and nearby communities. For discussion, recreation is divided into developed recreation, dispersed recreation, and visual quality.

Developed Recreation

Recreation is one of the major Forest uses. The Forest has 29 developed recreation sites, occupying 195 acres. These sites can provide 198,500 RVDs (based on optimum use at 40 percent of design capacity during the managed season). The developed use in 1984 was 66,000 RVDs.

Projected annual developed recreation use is:

1984-1990 -- 168,900 RVDs
1991-2000 -- 189,000 RVDs
2001-2010 -- 211,300 RVDs
2011-2020 -- 236,500 RVDs
2021-2030 -- 264,600 RVDs

The Forest administers 178 summer home sites, under special-use permits. In addition, the private sector can provide 56,100 RVDs of downhill skiing at two ski areas and 33,500 RVDs of use at five resorts and one organization camp.

Nationally, there is a high demand for downhill skiing and most skiers are highly mobile. Nonetheless, most use on the two Forest ski areas is local. Three potential ski areas have been identified; however, they have not been evaluated in depth. Any expansion or new construction would be considered on a case by case basis.

Dispersed Recreation

The Forest provides a wide range of dispersed recreation -- hiking, camping, backpacking, fishing, hunting, off-road vehicle use, cross-country skiing, horse back riding, birding, photography, wilderness use, and nature study. These activities take place in all recreation settings. Many activities are centered around the Forest trail system. Pleasure driving, hunting, camping, snowmobiling, and hiking (in that order) are the most popular activities.

The Forest is widely used for hunting and fishing. There are annual hunting seasons for elk, mule deer, whitetail deer, bighorn sheep, black bear, grizzly bear, antelope, and mountain goat. Based on total animal population and hunter success, the mule deer is the primary animal hunted. However, in terms of interest and popularity, elk hunting ranks highest. Wildlife photography, nature study, and bird watching are rapidly increasing. Current available dispersed recreation opportunity on the Forest is 2,369,000 RVDs. The use in 1984 was estimated to be 534,100 RVDs.

Projected dispersed recreation use is:

1984-1990 --	700,000 RVDs
1991-2000 --	894,000 RVDs
2001-2010 --	1,088,000 RVDs
2011-2020 --	1,283,000 RVDs
2021-2030 --	1,477,000 RVDs

Visual Quality

Visual quality is a consideration in recreation use, but it primarily effects the social environment. Visual quality changes when the physical and biological environment changes.

The current visual quality objectives are:

Preservation (448,000 acres) -- Classified Wilderness
-- RARE II Recommended Wilderness

Retention (231,000 acres) -- RARE II Further Planning and MWSA areas
-- Campgrounds and Ski Areas

Partial Retention (573,000 acres) -- Major roads and trails (includes rural and semi-primitive recreation settings) as defined in Forest Supervisor's Oct. 1980 memo, 1920, Classification Criteria for Major Roads

Modification (591,000 acres) -- All other land

CULTURAL PROPERTIES

The Lewis and Clark National Forest contains numerous significant cultural properties of both the prehistoric and historic eras, although relatively few sites have been located to date. Situated on the eastern side of the Rocky Mountain Range, this area is transitional between mountain and plains environmental zones. Prehistorically, it experienced cultural influence from both the Plateau culture to the west and Plains culture to the east.

Human occupation extended back into Late Pleistocene times, when Paleo-Indian big-game hunters occupied the plains and adjacent mountain environments. Sites of the following Archaic Period demonstrate continual human occupation from the Pleistocene through the recent geologic period to the present. During the past millennium, this area has been a corridor of cultural influence between the western Plateau groups and eastern Plains tribes. Historically, the Forest experienced ranching, homesteading, and mining influences.

The Lewis and Clark shows a great variety of site types, which might be expected in view of its location in a zone transitional between mountain and plains. All districts contain significant cultural resources. Primary prehistoric site types identified include pictograph sites and occupation sites. The majority of historic sites are related to mining activity and early settlement.

WILDERNESS

Classified Wilderness

A 384,407 acre portion of the Bob Marshall-Great Bear-Scapegoat Wilderness complex is along the Continental Divide in the Rocky Mountain Division. Elevation varies from 5,000 to more than 9,000 feet. Visitors travel by foot and horseback. Topography varies from rugged, precipitous ridge-tops to gentle sloping alpine meadows to forested river bottoms. Fossils of extinct animals are found in the limestone. The area has changed only slightly since the first white man came to Montana. All the big-game animals of the West live there, including the grizzly bear, deer, elk, moose, black bear, mountain goat, bighorn sheep, and mountain lion. Fish are plentiful. A well developed trail system exists in the area. Estimated 1984 wilderness use was 69,650 RVDs. The projected annual use for classified wilderness is:

1984-1990 -- 85,500 RVDs
1991-2000 -- 101,000 RVDs
2001-2010 -- 116,500 RVDs
2011-2020 -- 132,000 RVDs
2021-2030 -- 148,000 RVDs

Roadless Areas

The Lewis and Clark National Forest roadless area inventory was updated by removing those areas that have been developed since 1979 or are scheduled to be developed by 1984. Table 3.1 lists the inventoried roadless areas on or adjacent to the Lewis and Clark National Forest and selected resource values. A brief description of each area follows providing information on the wilderness and roadless characteristics. Appendix C provides more detailed information on the resources of each roadless area.

Wilderness Opportunity

The opportunity for classified wilderness varies from the present 384,407 acres to 1,386,639 acres, if all study areas and roadless areas were added to the wilderness system.

TABLE 3.1 ROADLESS AREAS

Name	Gross Acres	Net Acres	Suitable Timber Acres	Suitable Range Acres	Minerals 1/ Energy	Minerals 1/ Nonenergy	T&E Wildlife Habitat
Bear-Marshall-Scapegoat-Swan 1-485	864,933	863,781	276,228	35,597	861,875		838,527
Flathead NF Portion	348,950	348,950	104,680	0	348,950		348,950
Helena NF Portion	57,355	57,303	38,608	4,821	55,397		57,303
Lolo NF Portion	121,940	120,900	71,654	800	120,900		95,646
Lewis & Clark NF Portion	336,688	336,628	61,286	29,976	336,628	0	336,628
Badger-Two Medicine	102,100	102,100	16,136	4,594	102,100	0	102,100
Teton	63,133	63,133	6,278	6,754	63,133	0	63,133
Deep Creek/Reservoir North	45,962	45,962	4,575	3,160	45,922	0	45,922
Renshaw	57,611	57,521	15,870	10,460	57,591	0	57,551
Benchmark/Elk Creek	32,314	32,314	10,925	2,854	32,314	0	32,314
Silver King/Falls Creek	35,568	35,568	6,879	1,567	35,568	0	35,568
Sawtooth 1-721	15,500	15,500	2,633	2,323	15,500	0	15,500
Jefferson Division							
Crazy Mountains 1-541	136,547	87,100	25,580	4,555	0	0	0
Gallatin NF Portion	107,647	70,500	21,091	3,128	0	0	0
Lewis and Clark NF Portion	28,900	16,600	4,489	1,427	0	0	0
Tenderfoot-Deep Creek 1-726	98,500	88,400	49,655	8,134	0	0	0
Pilgrim Creek 1-727	50,000	49,500	24,950	3,348	0	0	0
Paine Gulch 1-728	8,500	8,500	4,837	393	0	0	0
Sawmill Creek 1-729	12,800	12,800	5,134	1,866	0	12,800	0
TW Mountain 1-730	8,800	8,500	4,106	1,000	0	8,500	0
Big Baldy 1-731	44,200	44,000	23,813	3,436	0	44,000	0
Granite Mountain 1-732	10,580	10,580	4,933	1,363	0	0	0
Tollgate-Sheep 1-733	27,000	26,800	14,546	970	0	26,800	0
Mount High 1-735	33,000	32,300	7,959	1,744	0	0	0
Highwood-Baldy 1-737	15,600	15,600	7,372	8,106	0	0	0
Highwoods 1-738	24,300	24,100	11,162	6,578	0	0	0
Bluff Mountain 1-740	37,120	37,120	10,504	11,289	0	0	0
Spring Creek 1-741	19,800	19,800	13,032	5,914	0	0	0
Box Canyon 1-742	12,920	11,647	4,226	4,413	11,647	0	0
Gallatin NF Portion	2,180	1,747	771	680	1,747	0	0
Lewis and Clark NF Portion	10,740	9,900	3,455	3,733	9,900	0	0
Castle Mountains 1-743	29,900	29,600	19,242	1,232	0	29,600	0
North Fork of Smith 1-744	8,800	8,800	6,810	1,928	0	0	0
Calf Creek 1-745	11,020	11,020	9,489	1,396	0	0	0
Eagle Park 1-746	6,300	6,300	4,949	1,796	0	0	0
Middle Fork Judith - MWSA	93,348	92,000	53,500	9,800	0	90,652	0
Big Snowies - MWSA	97,985	97,885	50,000	10,948	97,775	0	0

1/ Includes very high, high and moderate potential.

Listed below is a short description of wilderness suitability for each roadless areas on the Lewis and Clark National Forest. A more complete description can be found in Appendix C.

BEAR-MARSHALL-SCAPEGOAT-SWAN

This roadless area surrounds the Bob Marshall, Great Bear, and Scapegoat Wildernesses. The area is on the Flathead, Helena, Lewis and Clark, and Lolo National Forests and much of the area was formed by the overthrusting of land along faults. Most of the roadless area is rated as having a high to very high potential for oil and gas (the U.S. Geological Survey rated the area as low to moderate - U.S.G.S. Circular 902-A-P). Geologically the area is similar to major oil and gas producing areas of Wyoming and Canada. The area is steep and dissected with numerous valleys.

East of the Continental Divide the major ecotypes are the western spruce-fir forest and the Douglas fir forest, with some alpine meadow and foothill prairie. The area is sparsely forested and has low timber productivity, with south facing slopes often open or in a mosaic of forest and grasslands. Much of the east side is grazed by cattle.

Major ecosystems on the west side are the western spruce-fir forest with some Douglas fir and alpine meadow in the southern portion. The area is densely forested, with trees thinning to alpine meadows at higher elevations. Nearly all the major wildlife species are present here, including grizzly bear, black bear, cougar, elk, deer, wolf, moose, mountain goat, and bighorn sheep. This roadless area has special importance to many people because it is adjacent to the three wildernesses. Some people view parts of this roadless area as part of their wilderness experience in the Bob Marshall or Scapegoat Wildernesses.

Lewis and Clark National Forest

The Lewis and Clark National Forest contains 336,628 acres of the Bear-Marshall-Scapegoat-Swan roadless area. Six different parts of this roadless area have been identified on the Lewis and Clark National Forest. They are Badger-Two Medicine (102,100 acres), Teton (63,133 acres), Deep Creek/Reservoir North (45,922 acres), Renshaw (57,591 acres), Benchmark/Elk Creek (32,314 acres), and Silver King/Falls Creek (35,568 acres).

Badger-Two Medicine

The Badger-Two Medicine area consists of steep, rocky mountains dissected by numerous canyons and waterways. In the western portion, the Two Medicine River is a broad glaciated valley. This area was once part of the Blackfeet Indian

Reservation. The area was ceded from the reservation in 1896. The Blackfeet Indian Nation retains certain use rights on these lands under the Agreement of 1896. The Agreement specifically provides to the Blackfeet Tribe the following:

"Provided, That said Indians shall have, and do hereby reserve to themselves, the right to go upon any portion of the lands hereby conveyed so long as the same shall remain public lands of the United States, and to cut and remove therefrom wood and timber for agency and school purposes, and for their personal uses for houses, fences, and all other domestic purposes: And provide further, That the said Indians hereby reserve and retain the right to hunt upon said lands and to fish in the streams thereof so long as the same shall remain public lands of the United States under and in accordance with the provisions of the game and fish laws of the State of Montana."

Teton

The Teton area contains the North, South, and Middle Forks of the Teton River as well as the eastern sides of several high peaks along the Teton-Sun River divide. Important grizzly bear habitat is found here. Two heavily used passes, Route Creek Pass and Headquarters Pass, provide access to the Bob Marshall Wilderness.

Deep Creek/ Reservoir North

The Deep Creek/Reservoir North area consists of high parallel overthrust limestone reefs separated by deep valleys. Extensive south facing valleys provide critical winter range for elk, whitetail deer, mule deer, and bighorn sheep. This area is considered to have outstanding wilderness attributes as well as a high potential for oil and gas. A 41,838 acre portion of Deep Creek/Reservoir North area was selected for further planning under the RARE II study. This area will remain under further planning status until oil and gas potential has been determined.

Renshaw

The Renshaw area contains three distinct areas - Patricks Basin, which consists of Lange Creek draining north to Gibson Reservoir through a broad, heavily timbered valley; the plateau area, which consists of Fairview and Ford Creek Plateaus; and the South Fork of the Sun River. The Sun River elk herd, one of the largest in Montana, uses this area, along with the Bob Marshall Wilderness to the west. A 31,304 acre portion of the Renshaw area has been recommended for wilderness classification under the RARE II study.

Benchmark/Elk Creek	The Benchmark/Elk Creek area consists of high rugged mountains bisected by numerous valleys and streams. Patrol Mountain and Steamboat Lookout, both popular day hikes, provide spectacular views of surrounding wilderness to the west and of the foothills prairie to the east.
Silver King/Falls Creek	The Silver King/Falls Creek area includes the Dearborn River and Falls Creek drainages east of the Scapegoat Wilderness. The Dearborn River, which flows through an open valley before entering a scenic gorge in the Devils Glen area, consists of a series of rapids and deep pools which offer cutthroat trout fishing. The south side along Steamboat Mountain is bighorn sheep winter range. A 32,000 acre portion of the Silver King/Falls Creek area was recommended for wilderness classification under the RARE II study.
Sawtooth	The Sawtooth Roadless Area is also located in the Rocky Mountain Division. Human activity in this area has left extensive impact. The Sawtooth area possesses moderate opportunities for solitude because of its moderate size and narrow shape. The area offers a capacity of topography to challenge the visitor with its valley bottoms, high mountains and steep cliffs. The entire area is occupied grizzly bear habitat (threatened species). Observations of gray wolves (endangered species) are occasionally reported. There are several open roads within the area.
Crazy Mountains	The Crazy Mountain Roadless Area is a contiguous parcel in checkerboard ownership--public and private ownership alternating by section on the Gallatin and Lewis and Clark National Forest. Impacts from human activity are scattered throughout the area. There is an atmosphere of solitude on the mountains and high ridges. The high elevation lands offer more primitive recreation opportunities than the lower slopes. The amount and distribution of private lands makes it unmanageable to exclude the private land and keep any roadless area.
Tenderfoot -Deep Creek	The Tenderfoot-Deep Creek Roadless Area is a contiguous parcel. The southwest corner is in checkerboard ownership. Other than some low standard roads and trails, and livestock grazing, the natural integrity of the area is high.

The area's size and isolation from development gives the visitor a feeling of solitude. The area provides a feeling of isolation, but the terrain does not give a high degree of challenge to the recreationist. The Smith River along the western boundary, provides exceptional river floating opportunity.

Pilgrim Creek

The Pilgrim Creek Roadless Area is a contiguous unit of mostly public ownership. It is an isolated drainage with limited access because of adjacent private lands. Other than access trails and a small amount of cattle use, the area has had little development to change its natural appearance. The area has high opportunities for solitude because it is a large drainage with limited vista points. The large size of the area and its screening from other parts of the Forest and adjacent development offer the opportunity to get away from the man-influenced environment and experience a primitive recreation experience.

Paine Gulch

The Paine Gulch Roadless Area is a small area in all public ownership. The long-term ecological processes are undisturbed in most of the area, therefore, the natural integrity is high. This is one of the reasons why part of the area is a recommended research natural area. Little resource development covers the area. Because the Paine Gulch area is small and situated between a State highway and a major Forest road, and does not have any unique or spectacular vegetation or topography, the area is not noted for its solitude. The steep terrain, with broken limestone outcrops can be traversed by one who takes their time.

Sawmill Creek

The Sawmill Creek Roadless Area is a small area of all public ownership. The creek bottoms have had the only resource development. Although much of the area has no trail or road access, its small size, proximity to the Hughesville Mining District, and lack of vista points or unique scenery detracts from an atmosphere of solitude. The Sawmill Creek Area is not spectacular or challenging country for hiking.

TW Mountain

The TW Mountain Roadless Area is a contiguous parcel, with all but 300 acres in public ownership. Human activity in this area has left some impact. The area is small and persons visiting the area are always close to human activity and

development. The TW Mountain area has low opportunity for solitude because of its small size, landform, and nearby roads. The area offers little opportunity for primitive recreation.

Big Baldy

The Big Baldy Roadless Area is a contiguous parcel with all but 200 acres in public ownership. Human activity in this area has left some impact. The area is large enough and the topography is such that persons visiting the core of the area feel they are in a natural area. The Big Baldy area possesses moderate opportunity for solitude because of its large size, shape and topographic relief. The area offers a variety of topography to challenge the visitors.

Granite Mountain

The Granite Mountain Roadless Area is a contiguous parcel of National Forest System land. Human activity in the area has left some impact. The area is small and the mountain top topography is such that persons visiting the area are always close to human activity and development. The Granite Mountain Area has low opportunities for solitude because of its small size, landform and nearby development. The area offers little opportunity for primitive recreation.

Tollgate-Sheep

The Tollgate-Sheep Roadless Area has all but 200 acres in public ownership. Human use in the area has been from mining, scattered timber harvest, livestock grazing, and recreation. The Tollgate-Sheep area lacks in solitude characteristics because of its limited size, irregular shape, and visibility due to extensive ranching, farming, and rural civilization. There are some opportunities for primitive recreation.

Mount High

Mount High Roadless Area is a contiguous parcel with all but 700 acres in public ownership. Human impact in the area has been limited. The Mount High area is small and because of its shape and location visitors do not feel removed from ordinary human activities and development. The area has a low opportunity for solitude because of its small size and shape. The area provides

primitive recreation experiences such as elk hunting, camping, scenic viewing, hiking, and horseback riding.

Highwood Baldy

The Highwood Baldy Roadless Area is a contiguous parcel in all public ownership. Human activities in the area are limited. The area is small and the mountain top topography is such that persons visiting the area are always close to human activity and development. The Highwood Baldy Area has little opportunity for solitude because of its size, landform and nearby roads. The area offers some opportunity for primitive recreation.

Highwoods

The Highwoods is a contiguous parcel with all but 200 acres in public ownership. Human activity in this area has left some impact. The area is compact and the mountain top topography makes the adjacent agricultural developments visible. The Highwood area has little opportunity for solitude because of its size, landform and nearby roads. The area offers some opportunity for primitive recreation.

Bluff Mountain

The Bluff Mountain Roadless Area is a contiguous parcel of National Forest land crossed by about 20 miles of low standard roads and 25 miles of trails. The area has little opportunity for solitude because of its accessibility, size, and proximity to development on and off the Forest. The area has little opportunity for primitive recreation.

Spring Creek

Spring Creek Roadless Area is a contiguous parcel of National Forest System land in the south central portion of the Little Belt Mountains. Some developments, combined with the small size, have altered the long term ecological process and detracted from the areas natural appearance. Because the area has so much access and adjacent development, the visitors are not isolated from sights, sounds, and the presence of development. The primitive recreation opportunity is low.

Box Canyon

The Box Canyon Roadless Area is in the Crazy Mountains on the Gallatin and Lewis and Clark National Forest. Most of the northern portion of the area is in public ownership. However, the southern part has checkerboard ownership--public and private ownership alternating by section--which is typical of most of the Crazy Mountains. There are some disturbances to the areas natural integrity and appearance. The opportunity for

solitude is low. There is little opportunity for primitive recreation. The amount and distribution of private land makes it impossible to exclude the private land and keep any roadless area.

Castle Mountain

The Castle Mountain Roadless Area is a contiguous parcel of all but 300 acres in public ownership. Past resource development has mostly been from trail development and mining. Because of the areas proximity to White Sulphur Springs, visitors to the area are not removed from the sights and sounds of development. There are some opportunities for primitive recreation.

North Fork of Smith

The North Fork Smith Roadless Area is a contiguous parcel of National Forest System land in the south central portion of the Little Belt Mountains. The area shows evidence of several activities which disrupt the natural integrity of the landscape. The steep drainages only provide low to moderate opportunities for solitude. Primitive recreation opportunities are low. The location of this area amidst roaded land and the existing motorized use within the area would make wilderness management difficult.

Calf Creek

The Calf Creek Roadless Area is a contiguous parcel of National Forest System land in the southwestern portion of the Little Belt Mountains. It has remained essentially unroaded; and, therefore, does not show extensive evidence of human activities which would disrupt the natural integrity of the area. Solitude and semi-primitive recreation opportunities are moderate. The location of this unit amidst the roaded Forest land and the existing motorized use within the area would make wilderness management difficult.

Eagle Park

The Eagle Creek Roadless Area is a contiguous area of National Forest System land. Most of the area is one isolated drainage which is protected from outside development because of its topography and location. Because the area is isolated from the sights and sounds of development, visitors to the area can enjoy solitude. It has low primitive recreation opportunities.

Middle Fork Judith

The Middle Fork Judith Wilderness Study Area is essentially a natural environment. Unimproved roads on ridges and valley bottoms, cattle grazing along valley bottoms, sheep grazing on some ridges, pasture and drift fences along the Middle and Lost Fork bottoms, and structural development on private

	land are present. Although some development is adjacent to and within the boundaries of the area, there are opportunities for solitude in many parts of the Middle Fork. The area is popular for fishing and hunting.
Big Snowies	The natural integrity and appearance of the Big Snowies Wilderness Study Area has had little influence from resource development. Opportunities for solitude and primitive recreation are high, although core-to-perimeter distances rarely exceed four miles. The area is well accessed by trails, which are easily traversed.
MWSA	The 92,000 acre Middle Fork Judith and 97,885 acre Big Snowies areas in the Jefferson Division have been studied for wilderness classification as required by MWSA. The Regional Forester has recommended nonwilderness for both areas. However, the final decision will be made by Congress.

WILDLIFE AND FISH

The Forest's variety of terrain and vegetation provide habitat for 290 wildlife and fish species. This is among the most diverse and important habitat in the Northern Region. Estimated number of species by general groupings and game species are listed below.

SPECIES GROUP	TOTAL SPECIES	GAME SPECIES
Mammals	72	10
Birds	190	24
Reptiles	7	0
Amphibians	8	0
Fishes	13	7
TOTAL	290	41

Threatened and Endangered Species

Habitat has been identified on Lewis and Clark National Forest for threatened and endangered species as listed by the U.S. Fish and Wildlife Service.

Grizzly Bear

The grizzly bear is a Federally listed species. The Grizzly Bear Recovery Plan (Fish and Wildlife Service, 1982) identifies six grizzly bear ecosystems in the contiguous 48 states. Objective 4 of the Plan states "Establish recovery of at least three populations in three distinct grizzly bear ecosystems in order to delist the species in the contiguous 48 states."

North Continental Divide Grizzly Bear Ecosystem

The NCDGBE (North Continental Divide Grizzly Bear Ecosystem) is second priority for recovery in the Recovery Plan. The NCDGBE contains 5.7 million acres of occupied grizzly bear habitat. It includes Glacier National Park, parts of the Flathead and Blackfeet Indian Reservations, part of 5 National Forest (Flathead, Helena, Kootenai, Lewis and Clark, and Lolo), Bureau of Land Management parcels, and a significant amount of State and private lands (see Table 3.2). Four wildernesses (Bob Marshall, Mission Mountains, Great Bear, and Scapegoat) and one wilderness study area (Deep Creek/Reservoir North) are included.

The habitat of the grizzly in the NCDGBE National Forest has been mapped in accordance with "The Guidelines for Management Involving Grizzly Bears in the Greater Yellowstone Ecosystem", (USFS, 1979). These guidelines identify three management situations which are applicable to the ecosystem.

Management Situation 1 is described as containing grizzly population centers and habitat components necessary for survival and recovery of the bear. To assure recovery of the bear, land uses must be made compatible with survival and recovery of the bear or be eliminated. Management Situation 2 lacks distinct grizzly bear population centers and highly suitable habitat does not generally occur, although some habitat components exist and grizzly bears may be present on occasion. This area is not considered necessary for the survival and recovery of the bear. Attempts are made to make land uses compatible with grizzly bear needs. However, when grizzly bear needs and other land use needs are mutually exclusive, the other uses will prevail. Management Situation 3 is areas where grizzly presence is possible but infrequent. Development such as campgrounds, summer homes, and resorts on human concentration areas, make grizzly bear presence untenable for humans and/or grizzlies. Grizzly/human conflict minimization is a high priority. Grizzly bear presence and factors contributing to their presence will be actively discouraged.

TABLE 3.2 AREA SUMMARY OF THE NORTHERN CONTINENTAL DIVIDE GRIZZLY BEAR ECOSYSTEM

Unit	CURRENT OCCUPIED HABITAT THOUSAND ACRES			
	Mgmt. Sit 1.	Mgmt. Sit 2.	Mgmt. Sit 3.	Total
National Forest				
Flathead	1923	112	21	2056
Helena	121	59	0	180
L&C	764	5	7	776
Lolo	247	34	0	281
Kootenai	116	90	.4	207
Subtotal	3146	324	28	3500
National Park	1007	0	7	1014
Bureau of Land Management	24	0	0	24
Indian Reserve	------Unstratified------			362
State*	------Unstratified------			196
Private*	------Unstratified------			454
TOTALS	4177	324	35	5550

* Approximated Acres

Grizzly Bear Population

Population estimates for this ecosystem vary from 440-680 bears. The area is contiguous to Canadian grizzly bear populations and an interchange of bears is assumed.

TABLE 3.3 CAPACITY IN NUMBER OF BEARS FOR THE NORTHERN CONTINENTAL DIVIDE GRIZZLY BEAR ECOSYSTEM 1/

	Max. Potential	Recovery Goal 3/
National Park	200	200
Indian Reservation, State & Private Lands 2/	119	119
National Forest		
Flathead	230-250	207
Helena	19-20	18
L&C	85	81
Lolo	14	22
Kootenai	13-16	13
TOTALS	680-700	660

1/ The capacity estimate is based on three sets of numbers:

1. The recovery goal stated in the Recovery Plan.
2. An extrapolation of current bear densities from research.
3. Applied to each ownership according to percent control of the ecosystem.

2/ The capacity estimate for State, private and other Federal ownership is only an assessment of resource potential based on their percent ownership of the grizzly bear ecosystem. It does not constitute a management decision of how these lands should be managed.

3/ The Recovery Goal pertains to the National Forest share of the goal stated in the Grizzly Bear Recovery Plan. The disaggregation to Forests is an estimate of each Forest's share of the goal as stated in the Regional Guide. This goal may be adjusted slightly between Forests as more site-specific information and tradeoff is done in the Forest planning process.

Grizzly Bears and the Lewis and Clark National Forest

Grizzly bears are found throughout the Rocky Mountain Division. The entire 776,259 acre Division is occupied grizzly bear habitat. Approximately 763,889 acres within Management Situation 1, 4,070 acres within Management Situation 2, and 8,300 acres in Management Situation 3. The map was adjusted in 1985 based on recent information gathered by Montana Fish, Wildlife, and Parks and the Fish and Wildlife Service, and is in the planning records. For management and analysis purposes the entire Rocky Mountain Front has been divided into six BEU (Bear Evaluation Units). A BEU is an area of land which is ecologically similar and includes all the year-round requirements for a subpopulation of adult female grizzly bears. The precise carrying capacity of the Forest part of the NCDGBE to support grizzly bears is not known at this time. The current population estimate for grizzly bear on the Forest is 85 animals.

Studies on grizzly bears and their habitat have been ongoing on the Rocky Mountain Division for the past 8 years. During the period from 1977-1979, research was carried out by the Border Grizzly Project under a contract with the Bureau of Land Management. Since 1980 the Montana Department of Fish, Wildlife, and Parks has assumed the intensive grizzly bear monitoring work with funding continuing from the Interagency Monitoring Group, (Forest Service, Bureau of Land Management, Department of Fish, Wildlife, and Parks, and U.S. Fish and Wildlife Service), private industry (American Petrofina, Williams Exploration, Sun Exploration) and the Nature Conservancy.

Thirty-seven bears have been radio monitored. From this effort, over 2,500 bear sightings have been recorded and the vegetation being used has been identified. Seasonal ranges have been mapped. Important areas, such as feeding sites and denning areas, are being inventoried.

Study results documented to date along the east Rocky Mountain Front are the basis for the development of management guidelines for grizzly bear and their habitat.

Habitat improvement projects have been accomplished for grizzly bear during the last three years, including fencing of important habitat and prescribed burning. An average of 60 acres are being treated for grizzly bear habitat improvement annually under the current program.

Forest Relationship to Mortality Objectives for the Ecosystem

Known grizzly bear mortalities on the Rocky Mountain Front for the period 1977-83 totalled 16 bears or an average of about 2.3 per year (Aune et al. 1984). Half of these mortalities were legal hunting kills and the others were from non-hunting causes. In 1984 there were 5 grizzlies known to have been lost to the Rocky Mountain Front population. Of this total, 2 were legal hunting kills, 2 were illegal non-hunting mortalities and 1 bear was relocated to the Flathead National Forest following sheep depradations on private land east of the Forest.

In order to facilitate recovery, all Forests have a target of 0 preventable grizzly bear mortalities. A preventable mortality is one which could have reasonably been avoided by management actions, and is not a legal hunting mortality.

Table 3.4 shows the grizzly bear mortality with the ecosystem.

TABLE 3.4 GRIZZLY BEAR MORTALITY WITHIN THE NORTHERN CONTINENTAL DIVIDE ECOSYSTEM

(Data was obtained from the Preliminary Draft Grizzly Bear Programatic EIS, 1985, Montana Department of Fish, Wildlife, and Parks.)

	1967 - 74 *		1975 - 84	
	Total	Annual Avg.	Total	Annual Avg.
Mortality (No. of Bears)				
Nonhunting	100	(12.5)	92	(9.2)
Hunting	126	(15.8)	106	(10.6)
Total	226	(28.3)	198	(19.8)

* Prior to listing under the Endangered Species Act.

Wolf

Observations of gray wolves, a Federally listed endangered species, are occasionally reported on the Rocky Mountain District. Current population estimate is 4-8 wolves in the general area.

During the early 1970s the number of wolf sightings and observations of wolf sign increased steadily to a peak of about 40 reports in 1977 and then dropped rapidly in 1978 and 1979 (Ream and Mattson, 1979).

Even during the period of apparently higher wolf activity in the mid-1970s, no establishment of territories or pack activity by wolves was documented. There have been only a few reliable observations of wolves or their sign along the Rocky Mountain Front since 1979. However, in April of 1985, Mattson reported several additional sightings in response to the Hall Creek APD. The low number of wolf observations in recent years would seem to indicate lone wolves dispersing southward from Alberta, Canada, although some pack activity has been recently documented.

Two gray wolf mortalities have been documented on the Rocky Mountain Front during the past 20 years. In December 1968, a wolf was shot on private land along the Middle Fork Dearborn River about 8 miles east of the Forest. In November 1974, a hunter found a dead female wolf that had been shot on the North Fork Sun River near Cabin Creek (Ream and Mattson, 1978).

Bald Eagle

Bald eagles, a Federally listed endangered species, are commonly observed on various portions of the Forest during spring and fall migrations.

Most of these observations are made near the Forest boundary along the larger drainages. There is a major migration corridor for bald eagle east of the Forest on the Rocky Mountain Front. There is also a significant spring migration corridor north from the Shields River valley through the White Sulphur Springs area.

There are no winter concentrations of bald eagle on or immediately adjacent to the Forest. A few eagles do winter along the Sun River, Smith River, North Fork Musselshell River, and Judith River below the Forest boundary and probably make occasional use of big-game winter ranges on the Forest in those areas. There are no known active or historic bald eagle nest sites on the Forest.

Two areas of suitable-unoccupied nesting habitat for bald eagles have been delineated on the Forest. The larger of these areas, approximately 10,800 acres, is located on the Rocky Mountain Division and includes the country adjacent to the lower Sun River canyon and Gibson Reservoir. A second area, of about 6,000 acres of potential nesting habitat was identified along the Smith River canyon in the Little Belt Mountains.

Peregrine Falcon

The peregrine falcon, a Federally listed endangered species, is rarely observed on or near the Forest, and then only during seasonal migrations.

There are several sightings of migrating peregrines at Freezout Lake each year (DuBois, 1983). A few unconfirmed reports of adult peregrines being observed on the Forest during the breeding season have been received in recent years.

A total of 11 areas in the Rocky Mountains and 5 areas in the Little Belt Mountains were classified as suitable-unoccupied habitat. The areas delineated total about 64,000 acres. There are no known active or historic peregrine falcon eyries on the Forest.

Big Game

Big-game animals winter on or near the Forest. In the spring, these animals migrate to summer range at the higher elevations of the Forest. Important lambing and calving areas are along these migration routes.

Estimated 1982 populations of the major big-game animals on the Forest are:

Elk	8,500
Mule Deer	30,000
Whitetail Deer	4,500
Bighorn Sheep	1,100
Mountain Goat	500
Black Bear	1,050

Elk

Elk live in all of the mountain ranges. The Forest provides about 50 percent of elk winter-spring habitat needs. The remainder is on other Federal, State, and private land outside the Forest. The State maintains five winter game ranges adjacent to the Forest boundary. The game ranges are Sun River, Ear Mountain, Blackleaf, Judith, and Haymaker. The Sun River and Judith elk herds are among the major herds in Montana. The Rocky, Little Belt, Highwood, Castle, and Crazy Mountains all support sizable elk herds, and smaller herds are in the Big and Little Snowies.

Mule Deer

Mule deer live throughout the Forest during the spring, summer, and fall. Some deer winter in the lower Forest elevations. However, most winter habitat is on private land outside the Forest.

Other Big Game	The Sun River bighorn sheep herd, nearly 1,000 head, is the largest in Montana. White-tailed deer and black bear are widely distributed. Rocky Mountain goats are present, with the largest population in subalpine and alpine areas of the Rocky Mountain Division. Antelope live in portions of the Jefferson Division. Moose are in scattered portions of the Forest.
Interagency Monitoring Program	The Interagency Wildlife Monitoring Program is currently studying grizzly bear, mountain goat, bighorn sheep, elk and raptors. (Also see Threatened and Endangered Species.)
Sun River Game Preserve	The Sun River Game Preserve was established by the Montana State Legislature in 1913 (Picton, Harold, and Irene, 1975). The preserve is in the headwaters of the Sun River drainage in the Bob Marshall and Scapegoat Wildernesses. It contains 199,661 acres of mountainous country east of the Continental Divide. Sport hunting is prohibited by the Legislative status. Elk, bighorn sheep, mule deer, white-tailed deer, mountain goat, black bear, grizzly bear, and moose all use portions of the preserve. Based on the 1973 big-game habitat inventory, the preserve's important big-game ranges are generally in good condition. Some range, which the elk graze heavily in the spring, has deteriorated.
Small Game Species	Small game includes several upland game birds and migratory waterfowl. Three species of mountain grouse (blue, ruffed, and spruce), turkey, and ptarmigan live in the Forest. Merriam's turkey is well established on the south side of the Big Snowies and in the Little Snowy Mountains. Northern white-tailed ptarmigan occupy alpine habitat on the Rocky Mountain Front. A few waterfowl species nest by ponds, lakes, or rivers on the Forest, while several other species make brief visits during seasonal migrations.
Fish	Cold water game fish, including rainbow trout, brook trout, cutthroat trout, and mountain whitefish, are in all of the larger streams. Brown trout are found in a few large creeks or rivers near the Forest boundary. The Forest has 1,600 miles of streams of which 535 miles are considered fish habitat. Several (28) small, natural, and manmade lakes support trout. Several streams support populations of Upper Missouri River

(blackspotted) cutthroat trout. In addition, streams within the Forest contribute to downstream fisheries by providing rearing and spawning habitat as well as high quality water. Gibson Reservoir on the Sun River provides only marginal fish habitat due to large annual fluctuations in water level.

Non-Game Species

Several categories of wildlife other than game species live in the Forest. These include furbearers, predators, rodents, raptors, and song birds. Montana Department of Fish, Wildlife, and Parks considers the following Forest non-game species to be of special concern: hoary marmot, wolverine, lynx, harlequin duck, Cooper's hawk, golden eagle, prairie falcon, merlin, barred owl, great gray owl, saw-whet owl, and Brewer's sparrow.

Management Indicator Species

NFMA regulations specify that the following wildlife and fish categories will be considered when selecting indicator species.

-- Threatened and endangered species identified on State and Federal lists for the planning area.

-- Species with special habitat needs that may be influenced significantly by planned management programs.

-- Species commonly hunted, fished, or trapped.

-- Non-game species of special interest.

-- Additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality.

Table 3.5 lists management indicator species for the Lewis and Clark National Forest.

TABLE 3.5 MANAGEMENT INDICATOR SPECIES

Wildlife Category	Indicator Species
Endangered and Threatened	Grizzly Bear (T) Gray Wolf (E) Bald Eagle (E) Peregrine Falcon (E)
Commonly Hunted & Fished	Elk Mule Deer Whitetail Deer Black Bear Bighorn Sheep Mountain Goat Mountain Lion Blue Grouse Cutthroat Trout Brook Trout Rainbow Trout
Commonly Trapped	Beaver Bobcat
Special Interest	Wolverine Lynx Golden Eagle Prairie Falcon
Special Habitat Needs	
Old-Growth Forest	Goshawk
Tree Cavity-Conifer	Northern 3-Toed Woodpecker

LIVESTOCK GRAZING

Livestock grazing is a major use on 220,000 acres of grass, shrub, and forest land. Most grazing is under paid permit to 230 local ranchers, the permittees. The Forest is grazed for summer range.

The number of livestock and permitted AUMs in 1983 is summarized below. An AUM is the amount of forage required for one mature cow, or the equivalent, for one month.

CLASS OF LIVESTOCK	NUMBER	AUMS
Cattle	15,200	65,200
Horses & mules	7,000	2,600
Sheep	5,300	2,900
TOTAL	27,500	70,700

The horses and mules include transportation livestock under paid permit to outfitters and guides, as well as recreation livestock used free by the general public in the backcountry.

Livestock grazing is managed on 250 designated areas called allotments; 150 of the allotments have approved plans. Current management provides for no range deterioration from livestock and for improved distribution of animals on existing allotments.

Range management practices include constructing range improvements, such as fences and livestock water developments. Existing range improvements include over 430 miles of fences, 375 water developments, 75 cattleguards, and 15 miles of water transmission pipeline.

The annual maintenance of these improvements is important to good range management. Normally, maintenance is the permittee's responsibility. Construction and replacement of range improvements is usually a cooperative effort between the Forest Service and the permittee.

Noxious Weed Control

Noxious weeds are plants that threaten agricultural production and are therefore designated as "noxious" under State law. The primary noxious weeds on the Lewis and Clark National Forest include leafy spurge, spotted knapweed, whitetop, Canada thistle, and must thistle. The Forest

Service role in noxious weed control is to cooperate with State and local agencies in a unified approach. To be most effective, noxious weed control is applied using integrated pest management strategies. Biological control agents released to date on the Lewis and Clark National Forest include the seed-head weevil on musk thistle, and a gall producing seed-head fly on spotted knapweed. Cultural methods include the seeding and fertilizing of soil disturbed by road construction and logging. Chemical control of areas infested by noxious weeds is accomplished on about 100 to 500 acres annually.

Prescribed Fire

Strict fire control policies of the past have allowed the establishment and increasing density of sagebrush and conifers on range areas. A significant decline in forage available for both livestock and big-game animals has resulted. Prescribed fire can be used as a tool to simulate the natural historic and prehistoric role of fire in maintaining these open ranges. Currently the Forest is treating an average of about 500 acres annually with prescribed fire for range and wildlife habitat improvement.

Demand

Historically, cattle numbers have fluctuated up and down based on a number of economic conditions. In Montana, cattle numbers are predicted to remain the same or to decrease because of National market trends (Montana Crop and Livestock Reporting Service). Demand for additional livestock grazing on the Lewis and Clark National Forest is shown by the high interest in any available grazing permits and the applications by existing permittees to increase permitted numbers.

Under the current fee system, the demand for National Forest grazing will continue to exceed the forage alloted to domestic grazing.

TIMBER

For 100 years, the Forest's timber harvest has been a major contribution to central Montana's development and welfare. The entire Forest, including the wildernesses, was a source for house logs, fence posts, corral poles, mine timbers, railroad ties, rough lumber, and fuelwood. From 1946-1951 pulpwood was harvested from the Little Belt Mountains. As the demand for pulpwood decreased sawtimber became important. Today Douglas fir and lodgepole pine are the primary species produced. Ponderosa pine, spruce, and subalpine fir are present in lesser amounts.

The current timber sale program is 13 million board feet per year on a 554,215 acre land base. (See Table 3.6.) Based on approved timber management plans, with revisions to reflect RARE II and other decisions, the potential yield for the Forest is 17.0 million board feet.

TABLE 3.6 CURRENT ACRES BY LAND CLASS

Lewis and Clark National Forest--Total Acres	1,843,397
Water	(4,655)
Non-Forest Land	(482,205)
Forest Land	
--Not Capable of Producing Crops of Industrial Wood	(491,475)
--Productive Reserved	
Wilderness	(176,872)
Experimental Forest	(8,273)
--Productive Deferred	
RARE II Recommended Wilderness	(17,385)
RARE II Further Study	(4,227)
MWSA Areas	(104,090)
TOTAL SUITABLE FOREST LANDS	554,215

Timber Harvest

Timber harvest is designed to achieve multiple use objectives, including wildlife habitat improvement, transitory range, and insect and disease control. Harvesting methods used are clearcutting, shelterwood cutting, and selection cutting. A reforestation backlog does not exist because natural and artificial regeneration has been successful.

Over the past 25 years, the average timber sale program has averaged 13.5 million board feet, from a high of 35.6 in 1967 to a low of 4.4 in 1979. About 80 percent of the program is in large sales, ranging from 1 to 7 million board feet. The other 20 percent of the program is small sales, of post, poles, house logs, sawlogs, and other products.

Contrary to National and State timber trends, over the past 5 years the Forest has sold most all of the timber offered. Timber harvest has kept pace with the sales program. Currently the uncut volume is about 2½ times the annual sales program (30 million board feet). The timber industry likes to have about 3 times the sale program under contract.

Firewood

Ten million board feet per year of dead trees are removed for firewood. About 95 percent is removed by individuals for home use. Five percent is cut commercially.

Since the energy crisis in the early 1970s, the use of firewood for home heating has steadily increased. Firewood gathering has also become an important recreation activity. It is anticipated that firewood use has peaked and there could even be a decline over the next 10 years.

Wood Processing

Sawmills at Judith Gap, Townsend, Livingston, and Lewistown have an annual, one-shift, production capacity of about 50 million board feet. These four mills process approximately 75 to 90 percent of the annual Forest harvest. The Lewis and Clark Forest's contribution to this mill capacity is about 20 percent. Other volume is processed by several smaller mills as lumber, post, and poles.

Private lands have been supplying a large portion of the timber. Some of that private land is being converted to grazing land. The lower supply of private timber and more competition has increased the demand for Forest timber.

WATER

Quality and Quantity

Management activities can change water quality and quantity. Quantity, primarily as it affects irrigation, is part of the economic environment. All consumptive water rights for the Forest have been identified and filed with the State of Montana. State and Federal officials are negotiating to reserve the in-stream flow for fisheries and recreation uses.

Irrigation

Irrigation is the most important economic use of the water. Irrigation takes much of the available water in the mid- and late summer months. Most irrigation water comes from the Musselshell, Judith, North Fork Smith, Sun, Two Medicine, and Teton Rivers and associated reservoirs. There is more irrigation near the Rocky Mountain Division than the Jefferson Division.

The Upper Missouri River Basin Study reports that the two drainages encompassing the Forest (Missouri-Marias and Missouri-Musselshell) have an average annual diversion of 2,870,000 acre feet with a total depletion of 740,000 acre feet. These two drainages irrigate 616,000 acres. There is an average shortage of 270,000 acre feet that could be eliminated by conservation, but projected development may add about 20 percent more irrigated land.

A major state water development plan passed by the 1981 Montana Legislature indicates that the demand for water will increase, mostly for irrigation. This will require additional reservoir capacity.

Currently, localized water shortages, especially in the late summer months, occur on the Smith, Dearborn, Sun, Teton, and Musselshell Rivers. Such shortages could be expected to continue or even increase.

Other Uses

O'Brien Creek and Willow Creek are municipal watersheds that provide water for domestic use. The need for municipal water and energy will increase, in addition to an expected increase in the need for irrigation water, as population increases in surrounding communities.

In-stream uses must also be considered. Although the demand for in-stream use is difficult to assess, it is nonetheless important. Examples of in-stream use are hydroelectric power generation, preservation of fish and riparian habitat, and recreation. Most of these uses have intrinsic values that are more difficult to measure than consumptive uses, yet they must compete with consumptive uses.

AIR	Air quality can be reduced by dust, smoke, and automobile emissions resulting from increased recreation use and vegetative practices. Air quality is excellent with no direct point source problems and only occasional regional haze in late summer primarily from forest fires in western Montana or in Canada. Prevention of significant deterioration is Class I for Bob Marshall and Scapegoat Wildernesses and Class II for the Bob Marshall Wilderness Addition and remainder of the Forest. See the Clean Air Act, Public Law 88-206 as amended, for more informaton on air standards and classes.

MINERALS - OIL AND GAS

Overthrust Belt

The Lewis and Clark National Forest lies within the geologic structure known as the Overthrust Belt. The Overthrust Belt is part of a vast system of mountain ranges and basins extending from Alaska to Central America. This zone contains many likely source rocks for trapped oil and gas accumulations.

Little exploration drilling has been done in the Montana portion of the Overthrust Belt. However, a similar geologic formation in Alberta has major gas producing fields. Energy companies have recently discovered oil and gas in southwestern Wyoming and northern Utah. These discoveries have caused considerable speculation on the potential of the Overthrust Belt in Montana. As a consequence of this speculation, the Forest began receiving applications for oil and gas lease rights beginning in the mid 1970s. An Environmental Assessment that analyzed the effects of leasing nonwilderness lands on the Forest was approved in 1981.

Leases

This assessment allowed that occupancy leasing be recommended for accessible areas that can be adequately protected during oil and gas activity. Lease denial or issuance of a no-surface occupany lease is recommended when an application is located entirely within an area that could not be adequately protected. Leases partially located in sensitive areas that cannot be protected receive a no-surface occupancy stipulation for those sensitive areas. Timing restrictions, limited surface use, and the activity coordination stipulations are used to protect recreation, soil, water, and wildlife. The Further Planning Stipulation which allows for exploration but not production or field development until a decision is made was used on the Deep Creek-Reservoir North Further Planning Area (stipulations are described in Chapter IV-Minerals).

Based on previous environmental analyses, 413,516 acres of the Forest have been leased or recommendations have been made. Another 60,526 acres of lease applications are pending in the Silver King-Falls Creek and Renshaw roadless areas. In addition, 67,413 acres of leases are pending in the Big Snowies MWSA area. (See Table 3.7.) A lawsuit has been filed in Federal District Court questioning whether the requirements of NEPA and the Endangered Species Act have been met in the decision to issue oil and gas leases in the Deep Creek-Reservoir North Further Planning Area.

Wilderness

The Bob Marshall-Scapegoat-Great Bear Wilderness complex was withdrawn from mineral entry on January 1, 1984.

Hydrocarbon Potential

For the purposes of the Forest Plan, a hydrocarbon potential analysis has been conducted for the entire Forest, although some portions of the Forest lacked the information needed to evaluate their potential. This hydrocarbon analysis considered a variety of geological data and is based on a moderate amount of information. However, confirmation of the presence or absence of hydrocarbon resources can only be provided by exploratory drilling. Despite its limitations, this hydrocarbon analysis provides a good indication of where there may be interest in oil and gas exploration.

The highest potential areas occur throughout the Rocky Mountain Division and in portions of the Jefferson Division; specifically, the Crazy Mountains (largely leased currently) and areas adjacent to the Castle Mountains. The next most likely areas are the east and south flanks of the Snowies and Little Belt Mountains and the Highwood Mountains (largely leased currently). The remaining portions of the Forest, where enough information exists for potential predictions, are quite low in potential.

Hydrocarbons on the Forest are most likely to be found in the form of natural gas. Oil, if it is present at all, is probably present in only minor amounts.

Current Development

During the 1950s, two wells were drilled in the Blackleaf Canyon area and two were drilled in the Palookaville area. Only one well was successful. That well, located in the Blackleaf Canyon just a few hundred feet inside the Forest boundary, was re-entered four years ago. The re-entry was successful, but the well is not in production. An application to drill a wildcat exploratory well in Hall Creek was approved in January, 1985 and in Muddy Creek in June, 1985.

Natural Gas and Oil Use

Natural gas use in North America has grown from 9 percent of the total energy consumed in 1950 to 30 percent in 1975. In the United States, over 40 million households and 3 million businesses rely on natural gas. Energy use projections for the year 2000 for the United States show about the same level of use of natural gas as in 1982 (18.2 quadrillion British Thermal Units). Use of oil is projected to decrease slightly. (From 30.2 to 28.4 quadrillion British Thermal Units.) (Source: U.S. Department of Energy-Office of Policy and Analysis-1983.)

TABLE 3.7 LEASE STATUS AND STIPULATION REQUIREMENTS (April, 1984)

STIPULATIONS:	Rocky Mountain Division				Jefferson Division		
	NON-WILDERNESS	FURTHER PLANNING-DEEP CREEK-RESERVOIR NORTH	SILVER KING FALLS CREEK ROADLESS AREA	RENSHAW ROADLESS AREAS	NON-WILDERNESS	MIDDLE FORK JUDITH MWSA	BIG SNOWIES MWSA
ACRES W/PENDING APPLICATIONS	0	0	28,834	31,693	0	0	60,526
ACRES LEASED	293,849	41,838	0	0	87,686	0	0
Lease Stipulations No Surface Occupancy	105,785(36%)	34,664(82%)			6,138 (7%)		
Limited Surface Use	58,770(20%)	NA			5,261 (6%)		
Timing Restrictions: Elk & Deer Winter Range	49,954(17%)	17,321(41%)			19,290 (22%)		
Elk Calving	5,877(2%)	3,379(8%)			1,753 (2%)		
Sheep Lambing	5,850(2%)	3,379(8%)					
Migration Routes	11,754(4%)	2,112(5%)			4,383 (5%)		
Raptor Nesting	202(<1%)				30 (<1%)		
Other	1,931(<1%)				1,113 (<1%)		
Activity Coordination	293,849(100%)	41,838(100%)					
FURTHER PLANNING		41,838(100%)					

MINERALS-METALLICS AND OTHER MINERALS

The Jefferson Division has a history of silver, zinc, lead, copper, iron, sapphire, and gold production. Production was mostly from small mines which produced intermittently until the 1950s. Prospecting and mineral exploration takes place continually and can be expected to increase in the future.

Development work was taking place on patented mining claims in the Barker-Hughsville area. Lead, zinc, silver, and trace amounts of gold would be produced. Exploration for molybdenum has been carried out on Upper Carpenter Creek for several years. Amateur gold panning will probably increase.

Common variety minerals (sand, gravel, and building stone) are found throughout the Forest. They are used by the Forest Service in construction projects and available under mineral permit to other government agencies and private individuals. Several sandstone deposits are used in the building trades for fireplace and facing.

For most mineral commodities, except common varieties, the market is worldwide. As a result the mineral output provided by the Forest will not affect the price. However, the quantity produced is influenced by price.

Withdrawal Review

As required by Federal Land Policy and Management Act, a withdrawal review is being conducted. All administrative site withdrawals (32) which meet Forest criteria have been terminated. All campground withdrawals (8) have also been terminated. Approximately 23 power projects, (1,825 acres), 11 reclamation projects (16,582 acres), 10 administrative sites (1,396 acres), and 1 recreation area (780 acres) remain to be reviewed. The review of power and reclamation projects will be coordinated with the Bureau of Reclamation.

Wilderness

The Bob Marshall-Scapegoat-Great Bear Wilderness complex was withdrawn from mineral entry on January 1, 1984.

Other Rights

There are no reserved or outstanding mineral rights on the Forest. The U.S. Government has retained the mineral rights on 1,413 acres in the Jefferson Division (coal - 877 acres, oil and gas - 208 acres and uranium and thorium - 328 acres).

SOILS

Soil disturbance is generally caused by human activity including campground construction, grazing, timber harvest, mining, and road construction. A Forest landtype survey has been completed. This survey describes the soils, climax vegetation (habitat type), and landforms found on this Forest and their suitability for the more commonly applied land management practices. The landtype survey is a soil survey using selected properties of landforms and habitat types to characterize mapping units. The inventory is a 3rd order soil survey as defined in Forest Service Manual 2550. The survey is not correlated to the National Cooperative Soil Survey.

Slope angle is generally the greatest soil-related limitation on management activities. The Rocky Mountain Division has the greatest soil and watershed sensitivities. The steep topography combined with extensive glacial deposits susceptible to mass failure result in naturally unstable watersheds. On the Jefferson Division, the topography is less rugged and most landforms and soils are stable.

Management-made erosion causing water pollution has been identified on 373 acres. Restoration of this erosion is to be completed by the year 2000. This restoration will control water pollution beyond naturally occurring erosion. "Naturally occurring includes conditions or materials present from runoff...over which man has no control, or from developed land where all reasonable land, soil, and water conservation practices have been applied," (from Administrative Rules of Montana 1620.603). All present and future activities will require the application of all reasonable land, soil, and water conservation practices. Such practices are referred to as Best Management Practices.

LANDS

The social and economic environment may be affected by special land uses, rights-of-way acquisition, land adjustments, and utility corridors.

Special Land Uses

National Forest land is generally available for occupancy if such occupancy is in the public interest. Occupancy takes place through issuance of special-use permits. Over 380 special-use permits have been issued on the Forest. Special land use is increasing and will continue to do so.

Right-of-Way Acquisitions

Lack of public access to the Forest and the intermingling of public and private lands within the Forest boundary creates a variety of problems. The Forest lacks rights-of-way on many roads and most trails that cross private land. Landowners often enjoy nearly exclusive use of public land through controlling access. Recreationists often mistake unfenced private land for public land.

Demand for access to the Forest increases as more people use the Forest and as more private landowners restrict access across their land. Resistance to granting rights-of-way is likely to increase because of harrassment and vandalism.

Landownership Adjustments

Landownership within the Forest boundary includes private lands, mineral fractions, other Federal, and State lands. Ownership changes take place through land exchange and fee purchases. In 1967, a land adjustment plan was prepared for the Forest. The Forest Plan updates this plan and establishes specific guidelines for landownership adjustments.

Utility Corridors

The Forest has several transportation and utility corridors. A portion of a twin 500 KV powerline from Colstrip to Hot Springs corridor crosses the Crazy Mountains. U.S. Highway 89 divides the Little Belt Mountains. U.S. Highway 2 separates the Forest from Glacier National Park. Montana Power maintains a buried oil and gas line along this highway.

The Bonneville Power Administration and the Forest Service joint Pacific Northwest Long-Range East-West Corridor Study identified one potential corridor (R2N) crossing the Forest. This route parallels U.S. Highway 2.

FACILITIES-ROADS AND TRAILS

The inventoried road system consists of 155 miles of arterial roads, 643 miles of collector roads, and 597 miles of local roads (Transportation Inventory System, 1982). An estimated 600 miles of primitive roads are not on the inventory. Many other Federal, State, and County roads also provide access to the Forest. The trail system has 1,677 miles of managed trails. The Forest has seven National Recreation Trails and a portion of the Continental Divide National Scenic Trail.

The Forest constructs about 13 miles of arterial/collector roads yearly. (About 50 percent of this work is reconstruction.) Most all of these roads are constructed under the capital investment program. (Facilities are constructed by Congressionally appropriated funds.) These roads are usually open to year-round public use.

The Forest constructs about 8 miles of local roads yearly. All of these roads are built in support of the timber sale program. Most all of these roads are constructed as a requirement of the timber sale contract. These roads are usually closed or have seasonal use restrictions.

The Forest also constructs or reconstructs about 5 miles of trail yearly. All of this work is done under the capital investment program.

Because the Forest is on 7 distinct mountain ranges, public road or trail access to National Forest lands is a major need. Only the central Little Belts has adequate public access.

PROTECTION-FIRE MANAGEMENT

The Forest is operating under the 1984 Fire Management Action Plan. A Fire Management Plan for the Scapegoat Wilderness/Danaher portion of the Bob Marshall Wilderness was implemented in 1981. A Fire Management Plan for the remainder of the Bob Marshall Wilderness and Great Bear Wilderness was implemented in 1983. The Forest cooperates in the control of wildfire with BLM, State, and Counties through cooperative programs.

Wildfire burned an average of 492 acres per year on the Forest from 1970-79, at a suppression cost of about $208,000 per year. Over 70 percent of this loss occurred in the lodgepole pine type of the Little Belt Mountains.

Prescribed fire can be used in many forest types to improve timber, range and wildlife habitat, and to reduce wildfire hazard. In lodgepole pine the primary use of prescribed fire continues to be for hazard reduction and site preparation following timber harvesting. Wildfire acreage burned in lodgepole pine may be reduced by location and timing of timber sales and subsequent debris disposal. This would break up continuous, decadent lodgepole pine stands. However, due to the inherent "fire dependence" of lodgepole pine, large wildfires can be expected in this timber type.

In ponderosa pine and Douglas fir timber types, fire is a natural process. Without fire on a regular basis in these types, vegetation and fuels progress beyond the "natural" condition. This "unnatural" condition manifests itself with reduced forage and timber production due to: (1) dense conifer growth underneath the forest canopy, increasing competition to crop trees and forage; (2) conifer encroachment into grasslands; (3) a buildup of dead fuels on the forest floor; and (4) in many cases, a decadent grassland shrub condition. This state often leads to "unnaturally" large and destructive wildfires. As the ponderosa pine and Douglas fir types continue to deteriorate and "unnatural" fuel conditions increase, more and larger wildfires can be expected in the 1980-89 decade, regardless of the management strategy applied. Theoretically, this trend would continue until much of the "old-growth" forest has been recycled back to a younger, more fire resistant age class.

PROTECTION-LAW ENFORCEMENT

The Lewis and Clark National Forest recognizes that the statutory responsibility of the Forest Service for law enforcement is an integral part of all functions associated with the multiple-use concept in land management.

The Forest relies on cooperative law enforcement agreements with the counties, in order to provide much of the Forest's law enforcement needs. Currently the Forest has 11 cooperative agreements. The Forest Law Enforcement Plan calls for one Level IV trained employee in the Rocky Mountain Division, one in the Jefferson Division, and one Level III in the Supervisor's Office. Currently, the Forest has one Level IV trained employee on the Musselshell District and one Level III and one Level IV trained employee on the Rocky Mountain District.

The East Zone Criminal Investigator provides law enforcement leadership to the Forest. The investigator also performs those investigative tasks that are beyond the Forest's capability.

PROTECTION-INSECT AND DISEASE

Four insects and two diseases are the most damaging agents to the Forest's trees.

The mountain pine beetle presents the most serious threat to lodgepole pine. Beetle populations periodically increase and kill most large diameter trees in a forest before subsiding. The Forest has about 200,000 acres of lodgepole pine that are classified as highly susceptible to mountain pine beetle attacks and 87,000 acres are rated moderate risk (Gibson and Dooling, 1983.) The majority of these areas are on the Kings Hill District.

Mountain pine beetle also attacks ponderosa pine, especially second growth as is found in the Little Snowies. Mountain pine beetle has infested about 17,000 acres of ponderosa pine on the Jefferson Division. Though total number of affected trees is not great, their scattered nature indicates beetle populations are widespread.

The spruce bark beetle and Douglas fir bark beetle attack stands that are disturbed by blowdown, logging, or fire. The Forest has limited stands of spruce and extensive stands of Douglas fir that are susceptible to the bark beetle.

Western spruce budworm attacks spruce, Douglas fir, and subalpine fir. The larvae eats all the tree's new needles and some old needles, resulting in growth reduction. Continued defoliation kills the tree. Western spruce budworm has defoliated nearly 88,000 acres of Douglas fir on Forest and adjacent lands.

Dwarf mistletoe infestations occur in 36 percent of the commercial lodgepole pine. Root disease occurs extensively in Douglas fir and lodgepole pine, especially in the Little Belt Mountains and on the Rocky Mountain Division. Groups of trees and scattered individual trees are killed by root disease. Volume impact is not known, but is probably substantial.

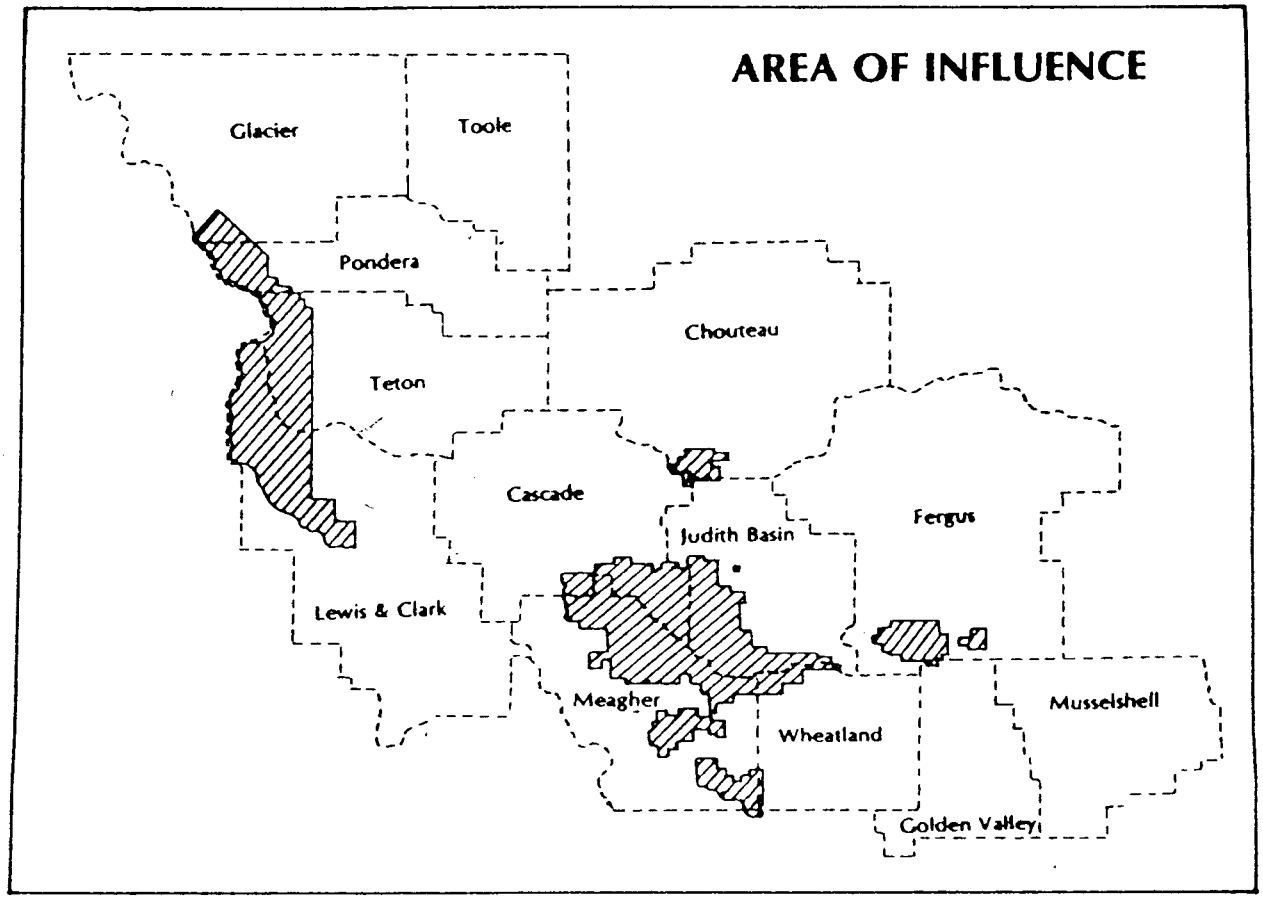
In addition to insects and disease, the Forest has over 20,000 acres of lodgepole pine and Douglas fir which have been damaged by red belt. (Trees killed in the winter by excessive water loss from drying wind when the ground is frozen.) Wind also is a damaging agent that has affected significant acreages of the Forest by blowing over trees.

AREA OF INFLUENCE

While the Forest provides resources to the region and to the nation, the local area-of-influence includes 13 central Montana counties. Approximately 185,000 people live in this area. This area-of-influence encompasses those people who depend on the Forest resources and who use it on a regular basis. Major communities include Great Falls, Lewistown, Harlowton, White Sulphur Springs, Choteau, Stanford, and Browning. A variety of lifestyles exist throughout these counties.

In Cascade County, over 90 percent of the residents live in Great Falls, while the other counties have mostly rural populations. People living closest to the Forest use more of the market-valued resources, by logging, grazing, and mining. All the communities use the Forest for recreation.

These broad lifestyle differences have a profound effect upon what demands are made on the Forest. Great Falls residents use the Forest for recreation and firewood gathering. Choteau's economy depends on the Forest for outfitting, grazing, tourism and more recently oil and gas. Stanford, Harlowton, and White Sulphur Springs are economically tied to the Forest through lumbering, grazing and recreation.



CURRENT SOCIAL AND ECONOMIC ENVIRONMENT

Population

During the 1970s, Montana's population grew by about 13 percent and the area-of-influence lost 4.3 percent. During the 1960s, all rural counties lost population due to farm consolidations, while the State's population remained static. During this period (1960s) the nation's population grew by 13 percent.

Employment and Income

Unemployment in the area is relatively low, but job opportunities are also limited. Effective buying income ranges from $12,600 in Toole County to $7,100 in Golden Valley County. The percentages of county residents classified as living in poverty conditions range from 19.4 percent in Golden Valley County to 6.2 percent in Lewis and Clark County.

Farming/ranching shows the highest percentage of wage and salary employment in all counties except Glacier, Cascade, and Lewis and Clark. The highest percentage in these counties, respectively, is service industries, Federal government, and State and local government.

Table 3.8 shows some of the major social/economic characteristics of these counties. Additional information can be found in the planning record, "Social Impact Assessment Baseline, 1980."

TABLE 3.8 COUNTY SOCIAL/ECONOMIC PROFILES

	1980 Population	% Change 1970-1980	% Change 1960-1970	% Unemployment 1985	Median Income 1985	Poverty Rate 1980	Number of Native Americans	Major Wage and Salary Employment
COUNTY								
JEFFERSON DIVISION								
Cascade	80,639	-1.4%	11.4%	8.2%	$10,492	8.1%	2670	federal government
Chouteau	6,090	-5.9%	-14.0%	5.8%	$10,849	8.6%	203	farming & ranching
Judith Basin	2,636	-1.1%	-15.6%	8.3%	$ 7,906	14.6%	10	farming & ranching
Fergus	13,052	3.5%	-11.1%	9.3%	$ 9,943	14.2%	125	farming & ranching
Golden Valley	1,017	9.2%	-23.0%	10.2%	$ 7,086	19.4%	3	farming & ranching
Wheatland	2,352	-7.0%	-16.7%	6.1%	$10,332	9.7%	8	farming & ranching
Meagher	2,145	1.1%	-18.9%	7.7%	$ 8,017	10.5%	10	farming & ranching
Musselshell	4,417	18.3%	-24.0%	7.1%	$ 8,960	15.1%	13	farming & ranching
ROCKY MOUNTAIN DIVISION								
Lewis & Clark	43,053	29.4%	18.8%	6.7%	$11,559	6.2%	771	state-local gov't
Toole	5,568	-4.6%	-3.5%	8.1%	$12,630	9.4%	83	farming & ranching
Teton	6,485	6.0%	-19.2%	5.1%	$ 9,275	11.4%	81	farming & ranching
Pondera	6,735	1.9%	-15.7%	6.2%	$10,973	10.8%	655	farming & ranching
Glacier	9,662	-10.3%	-7.2%	11.2%	$ 9,375	16.7%	4882	service industries

SOCIAL TRAITS	A community's social traits are necessary baseline information, if the traits are measurable and if the traits could be affected by Forest activities. These traits effect recreationists, ranchers, loggers, outfitters, oil and gas works, miners and other Forest users. Five traits have been selected as important indicators of effect on local communities.
Sense of Control/ Self Sufficiency	-- The feeling that one has control over one's life direction; not subject to control by people outside the community.
Lifestyle and Job Dependency	-- The use of Forest resources to maintain a way of living; the desire to maintain or enhance a way of living which may be financially dependent upon particular resource-related work.
Population Change and Crowding	-- The view that there are too few, enough, or too many people in an area.
Community Cohesion	-- The quality of adherence to a particular community cause; a sense of belonging that is associated with mutual community interests.
Landownership Patterns	-- The settlement with which people establish closeness or distance from one another; peoples' sense of appropriate private land use.

FUTURE SOCIAL AND ECONOMIC ENVIRONMENT

To estimate how different alternatives would affect the area-of-influence, the social and economic conditions, if current management continues, were projected. Predictions are centered around the Montana Alternative Simulation System, which is a computerized economic/demographic model. The model predicts population increases for Montana's more urban counties while the smaller, more rural counties are predicted to have little economic expansion and to lose population. These population projectors are summarized in Table 3.9 at the end of this chapter.

Most of the counties within the Forest's area-of-influence are expected to grow little, if at all, in the future. Most rural communities are expected: (1) to grow in population at a slower rate than the state; (2) to make no population gains; or (3) to decrease in population.

The area is dependent on agriculture and this reliance will probably increase. Farming consolidations within the past 20 years have forced many farmers and ranchers to move to urban centers and have forced young adults to find employment within Montana cities. This trend is expected to continue.

Glacier County

Slow population growth is expected in Glacier county during the next two decades. Oil and gas exploration, drilling, and development may boost these numbers, but unless there are major discoveries, no long-term significant population impacts would occur.

Toole County

Toole County is also expected to grow slowly within the coming years and any growth will probably be in the county seat of Shelby.

Pondera County

Further to the south, Pondera County is predicted to slowly drop in population. No new major economic activities are foreseen and with continuing farm consolidations the population will drop as young adults find it necessary to seek employment elsewhere. Conrad, the county seat, could grow because of oil and gas activities, but major discoveries and developments would be necessary for any long-term effects.

Teton County	Teton County shows no population change for the 1980s and small population drop thereafter. However, this county is probably the most susceptible to large population gains of any area within the Forest's area-of-influence. Presently Choteau is experiencing seasonally influxes of seismic workers and an occasional drill rig crew. But like other areas along the Rocky Mountain Front, major discoveries and development are needed for any long-term changes in the area's social structure.
Lewis and Clark County	Lewis and Clark County has a very high number of State and Federal employees, because the State capital, Helena, is in the southern part of the county. Helena residents sometimes recreate on the Forest; however, only the northern part of the county, near Augusta, is within the area-of-influence. The economy and population of the county is predicted to grow. However, Augusta will most likely parallel Teton County, with either a maintenance or drop in population.
Cascade County	Cascade County is expected to grow by about 9 percent by 1990, which is approximately the same growth rate as the State. Most of the growth is expected to be near or in Great Falls. Great Falls' population has always been highly dependent on Malmstrom Air Force Base and this will remain true for the years ahead. Any decisions concerning missile systems or other aerospace systems in Montana will have a direct effect on the community. Also, while the community of Neihart is not expected to grow, the surrounding area could due to an increase in summer homes.
Meagher, Wheatland, Golden Valley, and Musselshell Counties	Meagher, Wheatland, Golden Valley, and Musselshell Counties are not predicted to grow within the coming years. Despite years of attempts to lure small industries in these counties, they will most likely maintain their rural "Old West" characteristics and low population densities. Agriculturally counties such as these can only maintain a fixed population if new employment is generated. More tourism, manufacturing, mining, and oil and gas exploration are all possibilities for creating new employment and expanding the population. Except for oil and gas exploration, these ventures are unlikely.

White Sulphur Springs, in Meagher County, is predicted to maintain its population. However, with the closing of the Castle Mountain Sawmill the population is starting to decrease and unless these jobs are replaced this trend will continue.

The small gains shown for Musselshell County are based on an increase in coal mining in its southern sections and possibly more Billings commuters living on the southern edge of the county. Musselshell's changes would have little if any effect on the Forest.

Judith Basin and Fergus Counties

Judith Basin County's population is predicted to decline within the next two decades, although Stanford's population could remain steady because of its appeal as a retirement community.

Fergus County remains steady until 1990 and then grows a bit to the turn of the century. Lewistown, however, will grow within the next ten years, contrary to these predictions. The community is intermediate size and it can attract new industries. Its central location between Great Falls and Billings makes it a likely candidate for more retail and service industry jobs.

Chouteau County

Chouteau County is very agricultural and its population is expected to slowly drop within the next decade. New hydroelectric power projects along the Missouri River could impact Fort Benton.

TABLE 3.9

AREA-OF-INFLUENCE
County and Incorporated City and Town Population Projections, 1980-2000.

	1980	1985	1990	1995	2000
MONTANA	786,690	822,877	857,438	892,593	929,189
GLACIER	10,628	10,723	10,991	11,266	11,446
Browning	1,226	1,226	1,259	1,291	1,325
Cutbank	3,688	3,820	3,916	4,010	4,058
TOOLE	5,559	5,659	5,659	5,760	5,760
Kevin	208	208	208	208	208
Shelby	3,142	3,195	3,195	3,246	3,246
Sunburst	476	476	476	476	476
PONDERA	6,731	6,636	6,444	6,347	6,252
Conrad	3,074	2,843	2,755	2,711	2,667
Valier	640	640	597	597	597
TETON	6,491	6,491	6,387	6,284	6,284
Choteau	1,798	1,798	1,798	1,742	1,742
Dutton	359	359	359	359	359
Fairfield	650	650	650	650	650
CASCADE	80,696	83,762	87,634	91,208	94,856
Belt	825	825	825	876	876
Cascade	773	824	875	875	926
Great Falls	70,600	73,353	76,360	79,491	82,750
Neihart	91	91	91	91	91
MEAGHER	2,154	2,154	2,154	2,154	2,154
White Sulphur Springs	1,302	1,302	1,302	1,302	1,302
WHEATLAND	2,359	2,359	2,359	2,259	2,259
Harlowton	1,181	1,181	1,181	1,136	1,136
Judith Gap	213	213	213	213	213
GOLDEN VALLEY	1,026	1,026	913	913	913
Lavina	164	164	123	123	123
Ryegate	273	273	227	227	227
MUSSELSHELL	4,428	4,618	4,618	4,618	4,618
Melstone	238	238	238	238	238
Roundup	2,119	2,203	2,203	2,203	2,203
JUDITH BASIN	2,646	2,545	2,334	2,236	2,135
Hobson	261	261	261	195	195
Stanford	595	595	529	529	529
FERGUS	13,076	13,076	13,076	13,167	13,365
Denton	356	356	356	356	356
Grass Range	139	139	139	139	139
Lewistown	7,104	7,104	7,104	7,104	7,104
Moore	229	229	229	229	229
Winifred	155	155	155	155	155
CHOUTEAU	6,092	5,994	5,910	5,715	5,618
Big Sandy	835	835	835	779	779
Fort Benton	1,693	1,647	1,647	1,550	1,550
Geraldine	305	305	305	305	305
LEWIS & CLARK	43,053	43,933	47,749	51,662	56,260
TOTAL	184,939	194,976	195,958	203,589	211,920

Source: Montana Population Projections, 1980-2000. For Counties & Incorporated Cities and Towns. Environment Sciences Division, Montana Department of Health & Environmental Sciences, Helena, MT, 59601.

FEIS
Chapter IV
Environmental Consequences

Overview

This chapter forms the scientific and analytic basis for comparison of the alternatives, including the Preferred Alternative (G), described in Chapter II. The applicable environmental consequences, or effects, of all major activities and resource programs occurring in the various alternatives are discussed in this Chapter. The consequences are described as quantitative or qualitative changes from the current situation, in terms of significance, magnitude, and duration. Where applicable, the discussion identifies consequences that are direct, indirect, cumulative, or unavoidable. The relationship of short-term use of resources on long-term productivity is also discussed, along with the irreversible and irretrievable commitment of resources.

This chapter also discusses mitigation measures that have not previously been mentioned. Few, if any, can be identified. Mitigation has been built into the planning process. Mitigation was an important consideration developing standards, prescriptions, and minimum management requirements associated with each alternative. These items are discussed in other parts of this document or in special sections of the appendices and will not be repeated here. Mitigation under any one activity is the same for all alternatives, although the amount of an activity can change between alternatives.

This chapter is presented in a way that attempts to avoid redundant statements. For instance, the specific activities to enhance fish habitat are limited to a few acres on the Forest. However, the efforts to maintain or improve fish habitat are inherent in several other activities (timber harvest, road building, livestock grazing, etc.). The discussion for specific activities associated with fish habitat improvement is short, but effects on fish habitat are discussed in sections related to other activities or resources. Additional discussion of economic, social, biological, and physical effects and consequences of the alternative is found in Chapter II.

-over-

This chapter has been reformatted and additional information from the DEIS and DEIS-Supplement has been added to the environmental consequences of most resources.

Table 4.1 in the DEIS-Supplement has been eliminated and the information incorporated in specific tables throughout the chapter. Likewise, Short-Term Use vs. Maintenance and Enhancement of Long-Term Productivity, Irreversible and Irretreivable Commitment of Resources, and Adverse Effects Which Cannot be Avoided has been incorporated in each resource element, rather than summarized at the end of the chapter. Conflicts With the Objectives of Other Land Management Plans, Policies, and Controls, and Energy Requirements has been added to each section.

The Forest Plan defines direction for managing the Forest for the next 10 to 15 years. Planned output and effects are described for the first decade. Projected output and effects are described for other decades to indicate the long-term implication of continuing with the Plan.

NON-SIGNIFICANT FACTORS

NON-SIGNIFICANT FACTORS

The following factors of the environment would be affected the same under any alternative in this environmental impact statement.

Prime Farmlands
No prime farmlands are affected under any of the alternatives.

Wetlands
Wetlands are protected equally under all alternatives.

Minority, Economically Depressed, Elderly, Handicapped, Youth Groups, and Non-Traditional Groups
These groups receive equal treatment and consideration under all alternatives. The Forest will continue to be committed to Affirmative Action and Equal Employment Opportunity Programs.

Utility Corridors
Under all alternatives existing utility corridor permits would be honored. Future application would be considered on a case-by-case basis under Regional guidelines.

Other factors or uses on the Forest which will not significantly affect any environments of the Forest or the surrounding areas are:

Human Resource Programs
Human resource programs are the same under all alternatives and under current direction. No human resource program has a significant effect on the environment.

Administrative Facilities
The Forest has a number of administrative facilities. Any actions involving these facilities do not have a significant effect on any of the environments.

Law Enforcement
The Forest relies on cooperative law enforcement agreements with counties to provide much of its law enforcement needs. Currently the Forest has 11 cooperative agreements. Law enforcement does not change under any alternative nor does it have a significant effect on the environment.

DEVELOPED RECREATIION

Activities included in the Developed Recreation Program are the maintenance and construction of campgrounds, boating sites, and picnic sites. All alternatives maintain 29 existing campgrounds, boating sites, and picnic sites on 195 acres. These sites provide facilities for approximately 2,100 people at one time or 198,500 RVDs yearly. New campground site construction varies from 0 to 7 sites on 0 to 36 acres.

Changes Between Draft and Final EIS

None.

Recreation Sites

Table 4.1 displays the current number of sites, number of new sites, acres of new construction, additional RVDs of developed recreation, and total RVDs of developed recreation by alternative.

TABLE 4.1 DEVELOPED RECREATION

Alternative	No. of Current Sites	No. of Additional Sites	Acres of New Construction	Additional RVDs (thousand)	Total Capacity RVDs (thousand)
Current Plan	29	0	0	0	198
A-1	29	7	36	32	230
A-2	29	7	36	32	230
B-1	29	0	0	0	198
B-2	29	0	0	0	198
C	29	3	18	15	213
D	29	7	36	32	230
E-1	29	1	6	5	203
E-2	29	1	6	5	203
F	29	7	36	32	230
F-Departure	29	7	36	32	230
G-Preferred	29	7	36	32	230
H	29	7	36	32	230
I	29	7	36	32	230
J	29	7	36	32	230
K	29	3	18	15	213

Overcrowding and site damage in some localized areas is possible in all alternatives after the year 2005, because use is expected to exceed the current capacity of 198,000 RVDs. Alternatives B and Current Plan would provide no additional facilities. Alternative E would provide one additional campground and Alternatives C and K would provide three additional sites. Alternatives A, D, F, F

(Departure), G (Preferred), H, I, and J provide the most facilities by developing seven additional sites. Existing sites may also be expanded.

Development would not occur until needed. The Forest could mitigate overcrowding by limiting use or by inventorying and constructing additional sites.

Table 4.2 shows the anticipated use at developed sites.

TABLE 4.2
PROJECTED DEVELPOED RECREATION USE LEVELS

	1990	2000	2010	2020	2030
Project Use	168.9	189.0	211.3	236.5	264.6

EFFECTS ON:

Timber, Minerals, Livestock Grazing

Campground construction would limit timber harvest, mineral activities, and other developments in and around the recreation sites due to the need for retaining the natural landscape. Developed recreation sites are either withdrawn from mineral entry (Federal Land Policy and Management Act, 1976), or are protected through surface use regulations (36 CFR 252-Minerals). The sites would also be unavailable for oil and gas exploration and development (Oil and Gas Leasing on Nonwilderness Land Environmental Assessment, Lewis and Clark National Forest, 1981). Livestock grazing is prohibited in developed sites (CFR 261.14 - Developed Recreation Sites). These sites are small enough so that the total effects are minor.

Soil and Water

Soil erosion and water degradation may exist in localized areas where overcrowding occurs. If site design is not appropriate and maintenance is not adequate, overcrowding leads to destruction of vegetation resulting in a high potential for erosion (Cole and Schreiner, 1981). Under all alternatives, these localized problems would be mitigated through site maintenance and facility reconstruction and redesign.

Social and Economic

Developed recreation sites are high cost per acre facilities due to maintenance, monitoring, and policing. User fees are currently charged at many campgrounds and a decision could be made to charge user fees at other sites. Hence, some income is generated. However, the income fails to offset the cost of developed recreation activities.

	Since none of the alternatives meet the projected use level for developed recreation after the third decade, this may encourage the private sector to develop such facilities. Recreation construction would increase the employment and would require the purchase of materials and supplies. People would be needed (either Forest Service employees or private contractors) to maintain and manage the new sites. The increase in campground sites provides greater opportunity for people to get away from urban environments and enjoy the tranquility of the countryside.
Short-Term Use vs. Maintenance & Enhancement of Long-Term Productivity	The management of these developed sites will have an adverse effect on the long-term productivity. The vegetation of much of the site will be replaced by graveled or paved roads and camp spots. However, the pavement and gravel are necessary to prevent more severe on- and off-site effects on vegetation, soil, and water. The vegetation on most of the remainder will be suppressed by the concentrated trampling of the users. These effects would remain evident for a long period of time even though the sites were abandoned. Efforts to restore the sites to previous productivity would be costly and of questionable success.
Irreversible and Irretrievable Commitment of Resources	Once established, these sites are likely to be maintained and become an irreversible, long-term commitment of a resource. Wood fiber and forage that would have been produced on the sites represents an irretrievable loss.
Adverse Effects Which Cannot Be Avoided	Much of the vegetation on these sites will be lost or suppressed. Dust and noise from the concentration of campers will exist. The risk of vandalism will be present due to the numerous and costly facilities and more users concentrated in one place. Some wildlife habitat in the area will be destroyed or vacated by wildlife.
Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	Management of these sites might be construed as competition to privately owned campsites. However, these sites are frequently used by the local population and provide a different kind of experience than that provided by the private sector. Forest campgrounds are an historical use on the Forest and efforts to eliminate or drastically change this use would be opposed by the local population.

Energy Requirements

Energy will be used to maintain these sites. Most campgrounds will require administration and fee collection on a regular basis and yearly maintenance of the facilities will be energy intensive.

DISPERSED RECREATION

Dispersed recreation, such as driving for pleasure, hunting, fishing, hiking, and snowmobiling occurs on land and water that is not developed for concentrated recreation. The Dispersed Recreation Program maintains an environment for outdoor recreation. Specific management activities include maintenance and construction of facilities, signing, cleanup, patrolling for public safety, and visitor information and education.

Changes Between Draft and Final EIS

Information on recreation settings and social and economic consequences has been added.

Recreation Setting

Table 4.3 shows the recreation setting at the end of the first and fifth decades by alternative.

TABLE 4.3 RECREATION SETTING (Thousand Acres)

Planned Projected

	Primitive		Semi-Primitive		Roaded Natural Setting		Rural Setting	
	First Decade	Fifth Decade	First Decade	Fifth Decade	First Decade	Fifth Decade	First Decade	Firth Decade
Current Plan	448	448	902	762	476	616	17	17
A-1	637	637	697	328	492	861	17	17
A-2	448	448	887	328	492	1050	17	17
B-1	637	637	713	206	476	983	17	17
B-2	448	448	902	407	476	971	17	17
C	448	448	912	814	466	564	17	17
D	448	448	914	710	464	668	17	17
E-1	637	637	713	299	476	890	17	17
E-2	448	448	748	430	476	948	17	17
F	448	448	702	845	476	533	17	17
F-Departure	448	448	900	600	478	778	17	17
G	436	436	933	867	457	523	17	17
H	1049	1049	327	319	450	458	17	17
I	619	619	745	613	462	594	17	17
J	463	463	898	741	465	622	17	17
K	772	772	596	569	458	485	17	17

Dispersed recreation opportunities occur on primitive, semi-primitive, roaded natural, and rural areas. The amount of wilderness, timber harvest, and roading allowed by each alternative determines the recreation type. Primitive recreation

requires a roadless setting and does not allow motorized means of transportation. Semi-primitive recreation allows people to have a semi-primitive recreation experience with the convenience of snowmobiles, motorcycles, or other forms of motorized equipment. Some semi-primitive areas may be closed to specific motorized uses. Roaded natural recreation depends on roads that are a result of timber harvest. Rural areas have been heavily developed for human use.

Table 4.4 summarizes the changes in recreation setting over the next 50 years by alternative.

TABLE 4.4 CHANGE IN RECREATION SETTING (Thousand Acres)

Alternative	Primitive Setting	Semi-Primitive Setting	Roaded Natural Setting	Rural Setting
Current Plan	+ 64	-230	+166	0
A-1	+253	-745	+492	0
A-2	+ 64	-664	+660	0
B-1	+253	-786	+533	0
B-2	+ 64	-585	+521	0
C	+ 64	-178	+114	0
D	+ 64	-282	+218	0
E-1	+253	-693	+440	0
E-2	+ 64	-562	+498	0
F	+ 64	-147	+ 83	0
F-Departure	+ 64	-392	+328	0
G-Preferred	+ 52	-125	+ 73	0
H	+664	-672	+ 8	0
I	+235	-379	+144	0
J	+ 79	-251	+172	0
K	+387	-422	+ 35	0

EFFECT ON:

Recreation

All alternatives increase the primitive recreation opportunities. Alternative H would almost triple the opportunity as all available roadless areas will be managed in a primitive setting. Many semi-primitive recreational opportunities would be foregone. Alternatives A-1, B-1, E-1, and I also provide higher primitive recreation opportunities.

Alternative A-1, B-1, and E-1 would manage the Middle Fork Judith and Big Snowies in a primitive setting. All alternatives, except G (Preferred)

and J would manage the Renshaw and Falls Creek area in a primitive setting. Alternatives G (Preferred) and J would manage parts of these areas in a primitive setting.

All alternatives decrease the semi-primitive recreation opportunities. Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 have major reductions because of the timber sale program. Other alternatives have smaller reductions. Most of the reduction under Alternatives H and K is because semi-primitive lands are recommended for wilderness classification. This is also true for some of the reduction under other alternatives.

The Preferred Alternative (G), the Current Plan, and Alternatives C, D, F, F (Departure), and J maintain the popular Tenderfoot/Deep Creek/Pilgrim Creek, lower Middle Fork/Lost Fork of the Judith, and Big Snowies in a semi-primitive recreation setting. The Preferred Alternative (G) also maintains the Badger-Two Medicine area in semi-primitive recreation setting, although the Blackfeet Indian have retained the right to harvest timber (see Chapter III). Alternatives A-2, B-2, and E-2 would develop all these areas. Alternatives A-1, B-1, and E-1 would develop all areas except the Middle Fork Judith and Big Snowies, which would be recommended for wilderness classification. Alternatives H, I, J, and K would recommend all or part of the Tenderfoot/Deep Creek/Pilgrim Creek area become wilderness.

Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 have the greatest increase in roaded natural recreation opportunities. Alternatives E-1 and E-2 would increase roaded natural opportunities only on the Jefferson Division, because no timber harvest is scheduled on the Rocky Mountain Division. The Current Plan and Alternatives C, D, F, G (Preferred), H, I, J, and K provide for small increases in roaded natural recreation opportunities.

Wildlife

Increases in motorized recreation will displace some wildlife, especially big-game and T&E species. Road use restrictions will help protect wildlife in critical habitat areas (Lyon, 1982).

Primitive or semi-primitive recreation management provides more secure habitat for wildlife species which prefer areas with less roading and resource

	development. These species include grizzly bear, wolf, elk, and bighorn sheep. Alternatives G (Preferred), H, I, J, and K provide high levels of primitive or semi-primitive recreation management; Alternative A-2 would provide the least. Under all alternatives, areas managed for primitive or semi-primitive recreation will eventually reach the climax plant successional stages. Wildlife species that depend on old-growth trees and snags will benefit from this management.
Timber	Many of the primitive and semi-primitive recreation opportunities in all alternatives exist in areas which are not capable of timber production or where development costs are excessive. Thus, potential conflicts in these areas between timber management and primitive or semi-primitive recreation opportunities are slight. However, in Alternatives C, D, F, G (Preferred), H, I, J, and K less timber would be available for harvest because of maintaining more area in a primitive or semi-primitive condition.
Soil and Water	Dispersed campsites and other heavily used areas may adversely affect soil and water in localized areas, causing erosion, soil compaction, and water quality degradation (Cole and Schreiner, 1981). Dispersed recreation can also result in fecal pollution of water (Pacha, 1981). Off-road vehicles adversely impact soil and water in heavy use areas. These effects occur throughout the Forest where the terrain and vegetation permit this type of use. This can be mitigated through enforcement of the Forest Travel Plan.
Minerals	Semi-primitive recreation management limits additional road construction for surface resource management. Mining and oil and gas exploration and development would be allowed in these areas, but special stipulations would be used to ensure protection of recreation values ("Oil and Gas Leasing on Nonwilderness Land Environmental Assessment", 1981). New roads for subsurface resource development would be allowed only when the roads are a part of a logical exploration and development program. Areas under primitive (wilderness) recreation management would be withdrawn from all forms of mineral entry (see Minerals this chapter).

Protection	Because recreation use levels are expected to increase, the number of person-caused fires could also increase (Level I Fire Management Analysis Addendum, 1981). This adverse effect would be the same for all alternatives.
Social and Economic	Dispersed recreation has a positive affect on the present net value of the Forest. Direct revenue from dispersed recreation is insignificant, but because values have been assigned to recreation visitor days the availability of dispersed recreation opportunities can have an effect on the local economy. These include direct effects to sporting good stores, hotels, etc., indirect effects to those who sell goods and services to retailers, and induced effects to those providing common retail goods and services to the first two groups.
Short-Term Use vs. Maintenance & Enhancement of Long-Term Productivity	The long-term effects on productivity from construction and maintenance of trailhead facilities, toilets, hitchracks, stock ramps, and loading areas will be similar to those on developed recreation sites. However, the facilities will not be as concentrated as in developed sites.
Irreversible and Irretrievable Commitment of Resources	Once facilities are constructed, they are likely to be maintained into the foreseeable future. The vegetation displaced by these facilities constitutes an irretrievable loss of resources.
Adverse Effects Which Cannot Be Avoided	The loss of vegetation displaced by the construction and maintenance of the facilities cannot be avoided. These facilities will tend to concentrate use in certain areas and along certain routes. Despite care and maintenance, soil erosion will occur and water flow may be diverted along new channels.
Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	No conflicts have been identified.
Energy Requirements	Energy is required for the maintenance of dispersed recreation facilities, but is less than for maintenance of developed recreation facilities. The major use of energy associated with dispersed recreation is that used by the public in travel to and from the Forest and by the public in pursuit of recreational activities while on the Forest.

CULTURAL RESOURCE MANAGEMENT	Cultural resources refer to the Forest's archaeological and historic properties that are non-renewable resources making it necessary to maintain their scientific, historic, and social integrity. Primary prehistoric site types identified include pictograph sites and occupation sites. The majority of historic sites are related to mining activity and early settlement. The Forest's policy in all alternatives is to identify, protect, interpret, and manage cultural resources as directed by Executive Order 11593 (May 13, 1971). In all alternatives, an inventory of sites where ground-disturbing activities are planned will be required. If an historical site is found before or during ground disturbing activities, it will be documented and evaluated for possible preservation. Sites that are eligible for inclusion in the National Registry of Historic Places will be nominated.
Changes Between Draft and Final EIS	The entire section has been added to the final EIS in response to public concern.
EFFECTS ON :	
Resources	Protection of the cultural resource will have little effect on Forest resource production levels, since so few acres are involved. However, the cost of ground disturbing activities may be increased due to the need for cultural resources. Some timber may not be harvested on or near the identified cultural sites, but this volume will be small and can likely be harvested from other areas. Protection of the cultural resources has no adverse effect on the lifestyles in the area.
Short-Term Use vs. Maintenance & Enhancement of Long-Term Productivity	The protection given to historic sites will have some effect on the long-term productivity in and near the sites. The vegetation on and near the sites will not be harvested or will be harvested at less than maximum intensity. Consequently, although the native productivity may be maintained in these areas, opportunities to increase production through intensive management will be foregone.
Irreversible and Irretrievable Commitment of Resources	The cultural resources that are given protection will have an effect on the vegetative resources within the area. Since the commitment to protect these cultural resources is irreversible in the foreseeable future, the harvestable vegetation grown on these sites represents an irretrievable loss of that resource.

Adverse Effects Which Cannot Be Avoided	Some ground disturbing activities will inadvertantly enter and disturb some cultural resources despite the care and intensity of surveys prior to these activities. When this happens, some cultural resources will be lost.
Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	No conflicts have been identified. The Forest has met and will continue to meet with the Blackfeet Tribe to identify and protect cultural resources, to establish procedures to implement the American Indian Religion Freedom Act, and to negotiate agreements which will enable both the Forest service and the Blackfeet Tribe to share in the management of their resources reserved by the Blackfeet Tribe on the North End Geographic unit (ceded lands).
Energy Requirements	Managing the cultural resources will require little energy expenditure. Some travel will be necessary in the surveys and some energy may be used excavating or cataloging sites. This energy will be only a minor portion of the total Forest expenditure.

VISUAL RESOURCES

The Forest Service Visual Resource Program helps set visual quality objectives, which determine how much the natural landscape may be altered in appearance by various management activities, such as timber harvest and mining. Objectives are preservation, retention, partial retention, and modification of the natural landscape. Objectives are determined in part by how visible areas are from population centers, major highways, roads, trails, campgrounds, and other recreation developments.

Changes Between Draft and Final EIS

None.

Visual Quality Objectives

Table 4.5 shows the changes within the four visual quality objectives by alternative.

TABLE 4.5 CHANGE IN VISUAL QUALITY OBJECTIVES (Thousand Acres)

Alternatives	Preservation	Retention	Partial Retention	Modification
Current Plan	0	0	0	0
A-1	+189	-189	-179	+179
A-2	0	-189	-144	+333
B-1	+189	-189	-235	+235
B-2	0	-189	-129	+318
C	0	-189	+251	- 62
D	0	-189	+253	- 64
E-1	+189	-189	-120	+120
E-2	0	-189	-103	+292
F	+ 4	-189	+260	- 75
F-Departure	+ 4	-189	+ 15	+170
G-Preferred	- 9	-189	+220	- 22
H	+601	-189	-279	-133
I	+171	-189	+ 15	+ 3
J	+ 15	-189	+143	+ 31
K	+324	-189	- 29	-106

EFFECT ON :

Visual Quality

The natural landscape would be preserved more under Alternative H because of wilderness classification and to a lesser degree under Alternatives A-1, B-1, E-1, I, and J. The natural landscape would be maintained under Alternatives C, D, F, F (Departure), and G (Preferred), I, and J. More landscape would be modified in Alternatives A-1, A-2, B-1, B-2, E-1, E-2, and F (Departure). Short-term impacts from timber harvest and roads can be mitigated by locating and timing the harvest so

	that adverse impacts are minimized (USDA-Forest Service, National Forest Landscape Management 2:50 (Timber), 1980).
Timber	Alternatives which harvest the largest amount of timber would have the greatest affect on the landscape. Carefully designed vegetative manipulation, including timber harvest, can be used to enhance or maintain an area's visual quality (USDA-Forest Service, National Forest Landscape Management 2:50 (Timber), 1980).
Social and Economic	Even though most visual quality objectives can be met without prohibiting other resource activities, added care and cost is usually needed to meet the more restrictive objectives (Snow, 1982). These higher costs have the greatest effect on timber management activities including timber sale preparation and administration, road design and construction, logging, slash disposal, and site preparation. Alternatives A-1, A-2, E-1, and E-2 would have these higher costs because they harvest the most timber in visually sensitive zones.
Short-Term Use vs. Maintenance & Enhancement of Long-Term Productivity	The protection of visual resources will have little effect on the long-term productivity of the Forest.
Irreversible and Irretrievable Commitment of Resources	Management of the visual resource will slightly reduce the outputs of the resources. This is not an irreversible or irretrievable commitment.
Adverse Effects Which Cannot Be Avoided	Additional cost and care is usually needed to meet the more restrict visual quality objectives.
Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	No conflicts have been identified.
Energy Requirements	Managing the visual resources will require a small increase in energy over normal practices.

RESEARCH NATURAL AREAS	Research natural areas are part of the network of field ecological research areas. They are used for nonmanipulative research, observations, and study. Research natural areas typify important forest, shrubland, grassland, alpine, acquatic, and geologic types in each Forest Service region. Under all alternatives, the proposed Paine Gulch Research Natural Area and other candidate areas will be protected until the presence or absence of the habitat is verified.
Changes Between Draft and Final EIS	This section has been added to the final EIS.
EFFECT ON:	
Recreation	Public use which contributes to the modification of a research natural area will be discouraged or expressly prohibited if such uses threaten serious impairment of research or education values.
Grazing	Research natural areas are usually closed to domestic grazing to preserve the vegetation for which the area was created.
Timber	Timber harvest is not permitted in research natural areas.
Minerals	Research natural areas are generally withdrawn from mineral entry.
Facilities	Physical improvements such as roads, fences, or buildings are usually not permitted. However, in many instances, limited temporary improvements may be needed if these areas are to fulfill their scientific potential. Trails frequently are needed for access to conduct research and for educational purposes.
Protection	Maintenance of the natural processes within each area will be the prime consideration.
Social	The Forest Service encourages use of research natural areas by responsible scientists and educators.
Short-Term Use vs. Maintenance & Enhancement of Long-Term Productivity	The protection of research natural areas will have little effect on the long-term productivity of the Forest.

ACTIVITIES AND THEIR EFFECTS

Irreversible and Irretrievable Commitment of Resources	Management of the research natural areas will slightly reduce the outputs of commodity resources. This is not an irreversible or irretrievable commitment.
Adverse Effects Which Cannot Be Avoided	Additional cost and care is usually needed to meet the more restrict research natural area objectives.
Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	No conflicts have been identified.
Energy Requirements	Managing research natural areas will require a small expenditure in energy.

WILDERNESS

The Forest manages a 384,407 acre portion of the Bob Marshall-Great Bear-Scapegoat Wilderness complex. This classified acreage will not be decreased under any alternative. Congress clearly set forth management objectives for the wilderness resource on those lands included in the National Wilderness Preservation System. The System is to be managed in such a manner as to leave it unimpaired for future use and enjoyment as wilderness. The Forest Service is to administer wilderness for such other purpose for which it may have been established and also to preserve its wilderness character. It is to be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use. Activities include planning, administration, and management to protect natural conditions, maintenance of trails and signs, removal of garbage and litter, and education. The existing wilderness opportunity can be maintained with no additional impacts on the environment.

Changes Between Draft and Final EIS

Information on grazing and social and economic consequences has been added in response to public concern.

Wilderness Recommendations

Table 4.6 compares the additional acres in wilderness for each alternative. The amount of inventoried roadless land recommended for additional wilderness classification in each alternative is dependent on the goals and objectives for that alternative.

TABLE 4.6 ADDITIONAL WILDERNESS (Thousand Acres)

Alternative	Additional Wilderness
Current Plan	+ 64
A-1	+253
A-2	+ 64
B-1	+253
B-2	+ 64
C	+ 64
D	+ 64
E-1	+253
E-2	+ 64
F	+ 64
F-Departure	+ 64
G-Preferred	+ 52
H	+664
I	+235
J	+ 79
K	+387

Appendix C describes the site-specific effect of the alternatives on each roadless area. Roadless areas which are contiguous with adjacent National Forest (Roadless Areas 1-485, 1-541, and 1-742) are analyzed in their entirety in Appendix C. Only the portion that is on the Lewis and Clark National Forest is discussed in this chapter.

Alternative H provides the greatest wilderness opportunity by recommending classification of 664,326 acres as wilderness. This will ensure that available roadless lands of the Forest are maintained through wilderness classification. The wilderness resource is dominant in all management decisions where a choice must be made between wilderness values and visitors or any activity. Alternative I recommends 235,704 acres of wilderness. This alternative includes most areas where conservation groups have expressed an interest in wilderness classification. Alternative J recommends 79,005 acres be added to the wilderness system. These acres have high public support for wilderness and resource conflicts are minimal. Alternative K recommends 387,106 acres be added to the wilderness system. This alternative includes most areas where the public has expressed an interest in wilderness classification.

Alternative A-2, B-2, C, D, E-2, F, and F (Departure) recommend adding 63,304 acres to the National Wilderness Preservation System. These alternatives include the Renshaw and Silver King-Falls Creek RARE II recommended wilderness. Alternatives A-1, B-1, and E-1 recommend adding 253,189 acres to the system. These alternatives include the Renshaw and Silver King-Falls Creek recommended wilderness, Middle Fork Judith and Big Snowies MWSA areas. Alternative G (Preferred) recommends adding 51,834 acres along the east side of the Bob Marshall-Scapegoat Wildernesses. Note: This is a 4,990 acre increase from the DEIS-Supplement.

Roadless Reevalution

Planning regulations require a reevaluation of roadless lands for inclusion in the wilderness system when the Forest Plan is revised (10-15 years). The Forest has 1,002,232 acres of inventoried roadless lands. Table 4.7 shows the roadless land that will be developed by the end of the first, fifth, and fifthteenth decades.

TABLE 4.7 ROADLESS LANDS DEVELOPED (Thousand Acres)
Planned Projected

Alternative	First Decade	Fifth Decade	Fifthteenth Decade
Current Plan	- 26	-263	-408
A-1	- 42	-413	-691
A-2	- 42	-602	-881
B-1	- 26	-486	-630
B-2	- 26	-463	-684
C	- 16	-147	-208
D	- 14	-203	-263
E-1	- 26	-418	-468
E-2	- 26	-490	-654
F	- 26	-223	-223
F-Departure	- 28	-225	-225
G-Preferred	- 7	- 93	- 93
H	- 0	- 19	- 19
I	- 12	-117	-117
J	- 15	-146	-146
K	- 8	-104	-104

All alternatives, except Alternative H, would develop from 7,000 to 42,000 acres of roadless land during the first decade. This is 1 to 4 percent of the total roadless land on the Forest. By the end of the fifth decade, Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 would have developed from 413,000 to 602,000 acres of roadless land. This is 41 to 60 percent of the total roadless land on the Forest. Alternative F and F (Departure) would develop 223,000 acres, Alternative J 146,000 acres, Alternative G (Preferred) 93,000 acres, Alternative I 117,000 acres, and Alternative K 104,000 acres. This is from 9 to 22 percent of the total roadless land on the Forest. The Current Plan would develop 263,000 acres, about 26 percent of the roadless land. By the end of the fifthteenth decade, the Current Plan Alternatives A-1, A-2, B-1, B-2, C, D, E-1, E-2, F, and F (Departure) would develop additional roadless land.

EFFECTS ON:

Recreation

The primitive recreation opportunity is the greatest under Alternative H where 1,048,733 acres would be wilderness (See Table 4.3). Alternative I would provide 620,111 acres of primitive recreation, Alternative J, 463,412 acres, and

Alternative K, 771,513 acres. The primitive recreation opportunity would increase under Alternatives A-1, B-1, and E-1 where 637,596 acres would be wilderness. Alternative G (Preferred) would provide 51,834 acres of primitive recreation. The other alternatives, including the Current Plan, provide primitive recreation opportunity on 447,717 acres.

Under wilderness classification semi-primitive recreation opportunities, including motorized use, would be foregone. There would be a 300 RVDs reduction of motorized recreation per year under Alternatives A-2, B-2, C, D, E-2, F, and G (Preferred), 12,000 RVDs under Alternatives A-1, B-1, and E-1, 30,000 RVDs under Alternative H, 6,300 RVDs under Alternative I, 1,600 RVDs under Alternative J, and 7,600 RVDs under Alternative K. Alternative H would have a significant impact on motorized use of the Forest. Alternatives H, I, and K would have a significant impact on motorized use on the Rocky Mountain Division.

The existing wilderness can provide 47,000 RVDs of recreation based on the recreation opportunity system and existing facilities. The estimated 1984 actual use was 69,650 RVDs. This analysis shows parts of the wilderness are receiving actual use which exceeds the Forest expectation for a primitive recreation experience. However, the Forest feels that overuse is confined to major portial trail corridors and specific areas during the hunting season and that more capacity is available than shown by this analysis. Through the LAC (Limits of Acceptable Change) process the Forest will determine the ability of the biophysical environment to withstand recreation use, and the amount and type of use that is consistent with some measure of quality wilderness experience (see Forest Plan, Chapter III - Management Area P and Appendix U).

A wilderness recommendation on any area may lead to a small increase in the amount of recreation use because more people would seek recreation in these areas (Hendee, Stankey, and Lucus, 1978).

Wildlife

Wilderness provides security for wildlife and fish from development and disturbance. Several important species live in areas recommended for wilderness classification including grizzly bear, wolf, deer, elk, black bear, mountain goat, and mountain lion. Upper Missouri River cutthroat trout also occur in portions of these areas.

Range

Livestock grazing operations, where established prior to the designation of wilderness, shall be permitted to continue subject to provisions of The Wilderness Act. The Conference Report to S. 2009 (H.R. 96-1126 dated 6/24/80) in the section under "Grazing in National Forest Wilderness Areas" established guidelines and policy relative to domestic livestock grazing in wilderness. These guidelines, CFR 293.7, and subsequent Forest Service manual directives govern livestock management in wilderness.

While wilderness classification does not directly affect grazing levels, over the long run grazing would be reduced under Alternatives H and K because of a reduction of available forage. In areas allocated to wilderness, programs to control tree and shrub encroachment and to maintain or enhance forage production will be foregone.

Timber

Timber harvest opportunities would be foregone in the recommended wilderness areas under all alternatives. In order to harvest a higher level of timber under Alternatives A-1, E-1, and H, land outside of recommended wilderness areas must be more intensively managed.

Annual timber harvest opportunities foregone from the maximum timber benchmark because of wilderness classification recommendations are shown in Table 4.8.

TABLE 4.8 TIMBER HARVEST OPPORTUNITIES FOREGONE (Million Board Feet)

Alternative	Amount of Timber Foregone
A-1	8.431
A-2	1.181
B-1	8.431
B-2	1.181
C	1.181
D	1.181
E-1	8.431
E-2	1.181
F	1.181
F-Departure	1.181
G-Preferred	.806
H	16.819
I	6.602
J	2.386
K	11.507

Minerals

The Rocky Mountain District has a very high potential for oil and gas. Most nonwilderness land has been leased. There is a moderate potential for gold, silver, copper, lead, and zinc in some of the Jefferson Division. There is a potential for silver, copper, lead, zinc, and sapphires in portions of the Middle Fork Judith MWSA area (Hamilton and Mayerle, 1982). There is a potential for oil and gas in the south half of the Big Snowies MWSA area (Clement, 1982). Presently oil and gas leases are pending in the area. No recommendations on these leases will be made pending further Congressional direction.

Under all alternatives, areas designated as wilderness would be withdrawn from all forms of mineral entry subject to valid existing rights (Wilderness Act of 1964). Development and production would be allowed on claims or leases with valid discoveries made prior to the withdrawal date; however, it would be very restricted and costs would increase. Under all alternatives, mineral exploration and development would continue on nonwilderness lands.

Some areas on the Rocky Mountain Division that are recommended for wilderness designation have been leased for oil and gas exploration and development. This includes:

Alternative G (Preferred) - 13,830 acres
Alternative H - 125,302 acres
Alternative I - 84,000 acres
Alternative K - 12,302 acres

Soil and Water

Under wilderness classification, watersheds and soils would be protected from resource activities.

Protection

In all alternatives, areas recommended for wilderness classification would be more susceptible to mountain pine beetle attacks because no regulated timber harvest would be permitted (Wellner, 1978).

Inside of wilderness, fires will be controlled, as necessary, to prevent loss of human life and damage to resources in the wilderness. Fire may be used as a wilderness management tool under prescribed conditions. Prescribed fire in wilderness helps perpetuate the natural wilderness ecosystem. It provides diversity and wildlife habitat, including

habitat for T&E species and breaks up large expanses of heavy timber. Prescribed fire in wilderness may adversely affect air quality, visibility, and odor throughout the local area (FEIS, Fire Management in the Selway-Bitterroot Wilderness--A Proposed Policy Change, 1976).

Social and Economic

Increased visitors to areas classified as wilderness could help the local economy, outfitters, and other recreation-related businesses (Hendee, Stankey, and Lucus, 1978).

The social traits, sense of control and self-sufficiency, would be affected by the wilderness designation (see Table 4.39 at end of this chapter). Under Alternatives A-1, B-1, and E-1 the MWSA areas would be closed to motorized use. Under Alternatives H, I, and K, large areas of the Forest would be closed to motorized use. This would affect those people who enjoy motorized recreation, as in many areas motorized use is common. The same alternatives would create the positive feelings for those people wanting a pristine environment nearby, to "get away from it all;" having plants and animals in their natural state for observation; hunting, fishing, backpacking, and hiking in an environment without the impacts of man; and having the knowledge that an undeveloped area is nearby (Hendee, Stankey, and Lucus, 1978).

Classification of additional wilderness would have an effect on the economic base of the area. The social and economic benefits of timber harvested, mineral exploration and production would be foregone under a wilderness classification. Some of the timber volume may be restored by more intensive management on the rest of the Forest. This intensive management would be more expensive due to the efforts to protect other resources.

Roadless management can also have an important effect on the PNV of the Forest since relatively large areas of the Forest will be unroaded and available for timber harvest. Some of the lost timber volume may be recovered by more intensive, but also more expensive, management on other areas.

The effect of increased roadless allocation on the economic base and lifestyles of the area would be similar to that associated with additional wilderness classification.

Short-Term Use vs. Maintenance and Enhancement of Long-Term Productivity	The establishment of wilderness has some effect on long-term productivity. Although native productivity of resources is maintained and gene pools are protected at maximum levels under wilderness, opportunities to increase productivity through management of timber and wildlife habitat resources are foregone. The maintenance of primitive recreation opportunities is maximized as well as protection being given to sufficient old-growth timber and its associated wildlife habitat. Threatened or endangered plant and animal species are protected. Natural appearing landscapes are preserved. Although build-up of natural fuels may increase risks of wildfire, the use of prescribed fire should reduce this risk.
Irreversible and Irretrievable Commitment of Resources	Establishment of wilderness areas commits those areas to wilderness management. It is possible, though unlikely, for Congress to revoke wilderness classification. The classification results in an irretrievable loss of timber and prohibits the exploration and removal of mineral resources.
Adverse Effects Which Cannot Be Avoided	Wilderness classification limits the use of timber and mineral resources. Some hard rock mineral activity can occur depending on the history of development and the specific wording of the legislation but oil and gas activity is precluded. Although livestock grazing is permitted if it has historically occurred, more intensive utilization and improvements of allotments would not be allowed nor would new allotments be permitted. Control of insects, diseases, and noxious weeds is generally restricted or extremely costly because of the techniques required. Methods to suppress wildfires are restricted to those that cause little or no ground disturbance, i.e., building a fireline with shovels rather than with mechanical equipment, and may result in larger more costly fires.
Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	Wilderness classification is usually based on the desires of the public as defined in Congress. Consequently, classification rarely causes conflict with other management plans.
Energy Requirements	Of all areas on the Forest, wilderness makes the least demand on energy use. It is possible that wilderness users expend considerable energy in travel to and from wilderness areas, but little additional energy is expended within the area itself.

T & E SPECIES

Four Federally listed T&E species are found on the Lewis and Clark National Forest; grizzly bear (threatened), gray wolf (endangered), bald eagle (endangered), and peregrine falcon (endangered).

The management of T&E species and their habitat on National Forest System lands is guided by a number of Federal laws, executive orders and implementing regulations. In addition, internal management direction is documented in Chapter 2600 of the Forest Service Manual in the form of habitat management objectives, policy statements and operating procedures. State laws and regulations specify the protection and/or restricted taking of resident wildlife species which are Federally classified as threatened or endangered.

Changes Between Draft and Final EIS

T&E Species and other wildlife consequences have been separated. Information on T&E Species habitat and environmental consequences has been added in response to public concern.

GRIZZLY BEAR

Grizzly bears occupy habitat throughout the 776,259 acre Rocky Mountain Division. Over 98 percent of this area is in Management Situation 1, lands which are considered necessary for the survival and recovery of the grizzly bear (see Chapter III - Wildlife and Fish). The current estimated population is 85 grizzlies which use the Forest and adjacent lands along the Rocky Mountain Front. According to recent studies the current population is near the habitat capacity over much of the area. Habitat capacity for grizzly bear would be maintained under all alternatives. However, the potential for human/grizzly conflicts would increase under Alternatives A-1, A-2, B-1, B-2, D, F, and F (Departure).

The Grizzly Bear Recovery Plan states that the grizzly bear population in the Northern Continental Divide Grizzly Bear Ecosystem will be judged recovered when the population reaches 440 to 680 bears (Fish and Wildlife Service, 1982). The mean population (560) was used to establish an ecosystem goal. The Northern Regional disaggregation of the Recovery Plan goal indicates a population of 81 as the Lewis and Clark National Forest's portion of the ecosystem goal. Habitat capacity for that number of bears would be provided under all alternatives. The population goal is subject to revision based on the collection of additional bear monitoring data and the completion of habitat component mapping.

The IGBC (Interagency Grizzly Bear Committee) was formed in 1983 which includes representatives from the Forest Service, National Park Service, U.S. Fish and Wildlife Service, the Audubon Society, and State Game Departments in Montana, Wyoming, Idaho and Washington. After the IGBC became functional, sub-committees were formed for the major grizzly bear ecosystems. Based on management direction from the IGBC, the Northern Region-Forest Service developed a Grizzly Bear Action Plan for 1983-84 which included specific items to be accomplished by the various Forests involved. This Regional Action Plan was updated for 1985, and a Forest Grizzly Bear Inform and Involve Plan was prepared. Additional management guidance and emphasis has come from the IGBC in the form of standardized permit or contract clauses, lease stipulations, and coordinated law enforcement patrols in grizzly bear habitat.

In addition to the stratification of occupied grizzly bear habitat by management situations according to the "Yellowstone Guidelines" (see Chapter III - Wildlife), two other levels of grizzly bear habitat mapping are also being completed. Constituent element mapping is available for the Lewis and Clark Forest, but is subject to modification as additional bear data is collected. Habitat component mapping was started in 1984 on the southern portion of the Rocky Mountain Front with a total of 72,000 acres completed, of which 32,000 acres were on National Forest land. This mapping is being accelerated through the use of LANDSAT multispectral imagry and color infrared photographs. A computerized model to analyze the cumulative effects on each affected area (Bear Evaluation Unit) is also being developed for use in the Rocky Mountain Front. This will greatly aid in scheduling resource management activities in areas of grizzly bear habitat.

EFFECTS ON:

Resources

Adverse affects upon the grizzly bear and their habitat may result from individual resource projects or a combination of projects unless special mitigation measures are followed. In addition, the site-specific or long-term modification of important vegetative habitat components is another potential adverse affect on grizzly habitat. All alternatives schedule a continuing habitat improvement program for grizzly bear, primarily prescribed burning of important habitat components, which should result in long-term benefical affects for grizzlies. (See Table 4.9 this section.)

The Forest Service will continue to prepare a biological evaluation on all proposed resource projects, programs, or uses which may have an affect (adverse or beneficial) upon the grizzly bear or its habitat. Such evaluations will consider both site-specific impacts as well as a cumulative effects analysis of all ongoing and scheduled activities of the effected area (Bear Evaluation Unit). The completion of grizzly bear habitat component mapping and the development of the cumulative effects model are important factors in strengthening the biological evaluation process.

Range

Livestock grazing would increase on grizzly bear habitat in Alternatives A-1, A-2, B-1, B-2, D, F, and F (Departure). A small increase in livestock grazing is found in Alternatives G (Preferred), and J. Grazing on the Rocky Mountain Division under Alternatives C, E-1, E-2, H, I, and K, would not increase. Mitigation measures designed to lessen the impacts on grizzly bear would be needed. These measures include timing restrictions to avoid grizzly bear use periods, and scheduling of concurrent activities to control human use levels over large areas. The potential for increased forage competition between cattle and grizzly bear can be reduced through intensive livestock grazing systems and structural improvements, as needed, to protect seasonally important habitats. Ranch operations would have to absorb some of the mitigating costs. Many of the mitigation measures described and currently being used would continue under all alternatives.

Timber

Grizzly bear habitat management constrains timber management options (Zager, 1980). However, timber harvest can be used to create more favorable quality, quantity, and distribution of forage areas. Alternatives A-1, A-2, B-1, B-2, C, D, F, and J have a small sale program on the Rocky Mountain Division. Under the Preferred Alternative - G, posts, poles, houselogs, firewood, and other wood products will be harvested to meet local needs. Permanent roads will not be constructed under this program. The Badger-Two Medicine area will be managed for semi-primitive recreation values, although the Blackfeet Indians have retained the right to harvest timber (see Chapter III). The scheduling and distribution of harvest would be governed by grizzly bear habitat management objectives. Over time, grizzly bear manage-

ment in a given area would reduce timber harvest and value because intensive timber management and extensive harvest are not compatible with grizzly bear objectives.

Minerals

Under all alternatives, habitat management for grizzly bears would affect oil and gas activities. Grizzly bear habitat management requires oil and gas activities to follow special guidelines as required by the Endangered Species Act of 1972 (Oil and Gas Leasing on Nonwilderness Land Environmental Assessment, 1981). These guidelines increase the cost of the oil and gas operations and in some cases preclude the activity altogether.

Facilities

Grizzly bear habitat management objectives also require road use restrictions (Jonkel, 1975). These restrictions affect roaded recreation opportunities. Restrictions may be seasonal (spring and fall) or year-round depending on the specific area and management objectives.

WOLF

Gray wolf are occasionally observed on the Rocky Mountain District. Most of these sightings are of single animals. These wolves are apparently animals which have dispersed from established pack territories north of the Canadian border. However, recent pair activity has been documented.

The Northern Rocky Mountain Wolf Recovery Plan sets a primary objective of re-establishing and maintaining at least two populations of wolves within their former range. A Regional disaggregation of the Recovery Plan goal indicates a population level of 10 for the Lewis and Clark National Forest. Habitat capable of supporting this number of wolves would be provided under all alternatives. However, the potential for human/wolf conflicts would increase under Alternatives A-1, A-2, B-1, B-2, D, F, and F (Departure). Mitigation measures designed to lessen the impact on the wolf would be needed.

Recovery of the endangered gray wolf population is linked to the Forest's management of habitat for grizzly bears. Maintenance of security from human disturbance is believed to constitute the most critical habitat need of the existing gray wolf population (Ream, 1978). The grizzly bear habitat management objectives provide for security. An adequate prey base (food source) will be available for 10 or more wolves. Site-specific habitat elements, such as denning areas and rendezvous sites, will be protected as they become established and are identified.

EFFECTS ON:	
Resources	Adverse affects upon the gray wolf or its habitat may result from road construction, timber harvest, oil and gas exploration, and other activities unless specified mitigation measures are followed (see grizzly bear, this section). Such affects could include reductions in habitat effectiveness, displacement of ungulate prey bases, or increases in the potential for human-caused wolf mortality. Habitat improvement programs designed to maintain or enhance big-game ranges will provide indirect beneficial affects for the wolf by protecting or increasing habitat capacity for ungulate populations. The establishment of a viable wolf population would provide a more definitive basis for the determination of potential adverse or beneficial affects. The cumulative effects model currently being developed for grizzly bear habitat evaluation should prove useful as a basis for analyzing effects on wolf habitat related to human activities. If a wolf pack should become established, the pack territory would be the logical unit for the evaluation of cumulative effects.
PEREGRINE FALCON -BALD EAGLE	No measureable adverse or beneficial affects are expected on the suitable, unoccupied habitat identified for the peregrine falcon or bald eagle (see Chapter III, Wildlife and Fish). Although temporary or short-term reductions in habitat effectiveness may result from resource development activities in the vicinity of suitable nesting habitat, no physical destruction or long-term habitat degradation is forseen. Should one or more nesting territories for either of these species be established, it will be appropriate to reevaluate the determination of affect for that species.
WILDLIFE AND FISH	The Wildlife Management Program maintains and improves wildlife habitat. Wildlife habitat includes big-game winter ranges, calving and lambing areas, migration routes, threatened and endangered species habitat, elk summer-fall ranges, raptor nesting sites, and significant non-game habitat. Activities include temporarily increasing the amount of shrubs, forbs, and grasses available to various species through prescribed burning; protecting some sites for species dependent upon old-growth or riparian environment; maintaining hiding and thermal cover for some species; and minimizing the disturbances of human activity in essential habitats.

The Fisheries Management Program concentrates on activities on or adjacent to riparian areas. Fish habitat management objectives including minimizing sediment deposition into streams and lakes; maintaining stream bank cover and stability; and constructing fish habitat structures such as cross channel structures to develop pools.

Changes Between Draft and Final EIS

T&E Species and other wildlife consequences have been separated. Information on wilderness and facilities consequences has been added in response to public concern.

Wildlife Habitat Improvement

Table 4.9 lists T&E species, wildlife, and fish habitat improvement programs by alternative.

TABLE 4.9 WILDLIFE HABITAT IMPROVEMENT

Alternative	Wildlife Habitat Improvement (Acres)	Fish Habitat (Structures)	T&E Species Habitat Improvement (Acres)
Current Plan	360	4	66
A-1	912	8	146
A-2	1006	8	150
B-1	302	4	68
B-2	332	4	68
C	993	8	155
D	329	4	71
E-1	490	8	140
E-2	498	8	140
F	553	6	85
F-Departure	553	6	85
G-Preferred	600	25	100
H	388	6	48
I	557	6	86
J	557	6	84
K	736	8	47

The wildlife habitat improvement program is divided into three parts - T&E Species Habitat, Fish Habitat, and Wildlife Habitat. T&E Species Habitat is limited to the Rocky Mountain Division, Fish Habitat to riparian area and Wildlife Habitat is Forest-wide.

Alternatives A-1, A-2, C, and K have intensive wildlife habitat improvement programs compared to the other alternatives. Much of the habitat improvement program for Alternatives A-1 and A-2 is to help mitigate the high timber and grazing activities. Alternative C has a high wildlife habitat improvement program because of the alternative's emphasis on wildlife. Alternatives B-1, B-2, D, E-1, E-2, F, F (Departure), G (Preferred)*, H, I, J, and the Current Plan have moderate wildlife habitat improvement programs to correspond with timber, grazing, and wilderness programs. *Alternative G (Preferred) has been increased from the DEIS-Supplement.

Wildlife Populations

Montana Department of Fish, Wildlife, and Parks is responsible for management of wildlife populations.

Because wildlife populations are directly related to the quality and extent of their habitat, National Forest land managers will coordinate their activities with the Montana Department of Fish, Wildlife, and Parks. This coordination results in recommendations and actions concerning several activities (especially timber harvest, oil and gas activities, and road management). Table 4.10 lists the wildlife population potentials.

TABLE 4.10 WILDLIFE POPULATION POTENTIALS

Planned Projected

Alternative	No. of Grizzly Bears		No. of Elk		No. of Catchable Trout	
	First Decade	Fifth Decade	First Decade	Fifth Decade	First Decade	Fifth Decade
Current Plan	85	85	8500	8500	202,000	202,000
A-1	85	85	8500	8100	202,000	167,000
A-2	85	85	8500	8000	202,000	174,000
B-1	85	85	8500	8300	202,000	186,000
B-2	85	85	8500	8200	202,000	186,000
C	85	85	8500	9300	202,000	208,000
D	85	85	8500	7800	202,000	170,000
E-1	85	85	8500	8200	202,000	192,000
E-2	85	85	8500	8100	202,000	192,000
F	85	85	8500	8400	202,000	190,000
F-Departure	85	85	8500	8400	202,000	190,000
G-Preferred	85	85	8500	8500	202,000	202,000
H	85	85	8500	8800	202,000	204,000
I	85	85	8500	8500	202,000	202,000
J	85	85	8500	8500	202,000	202,000
K	85	85	8500	9200	202,000	208,000

All alternatives maintain the habitat capacity for 85 grizzly bears. There would be little change in elk and catchable trout population potentials during the first decade. Alternatives C's, H's, and K's wildlife program have the most long-term beneficial effect on elk--increasing the population potential by 800, 300, 700 respectively, by 2030.

Alternatives A, B, D, E, and F decrease elk habitat capacity by 100-700 elk over the 50-year period because of higher roading, timber harvest, and grazing levels. The Current Plan, Alternative G (Preferred), I, and J would maintain the habitat capacity for elk.

The Current Plan, Alternative G (Preferred), I, and J would maintain the habitat for catchable trout populations. Alternative C, H, and K would increase catchable trout habitat, but the rest of the alternatives would decrease trout habitat by 10,000-35,000 fish over 50 years, because of higher roading, timber harvest, and grazing levels.

A wide variety of non-game wildlife that are dependent upon a variety of habitat occur on the Forest. (e.g. golden eagle, prairie falcon, goshawk, Northern 3-toed woodpecker, etc.) No activities to directly manipulate non-game habitat are planned, but other resource activities will alter this non-game habitat and the changes will be evaluated and monitored.

Table 4.11 shows elk hunter days by alternative.

TABLE 4.11 ELK HUNTER RECREATION (Thousand Hunter Days)

Planned Projected

Alternatives	Elk Hunter Days: First Decade		Fifth Decade
Current Plan	63.9		63.9
A-1	63.9		50.4
A-2	63.3		51.6
B-1	63.9		56.3
B-2	63.9		56.3
C	63.9		71.9
D	62.9		56.9
E-1	63.5		55.0
E-2	63.9		53.0
F	63.9		60.1
F-Departure	63.9		57.3
G-Preferred	63.7		60.2
H	63.0		67.0
I	63.4		61.2
J	63.7		60.5
K	63.9		71.9

	Alternative C, H, and K increase the number of elk hunter days of recreation. Elk hunter days are used to express elk hunting opportunity and habitat quality. The Current Plan maintains this opportunity. Under all other alternatives, elk hunter days decrease.
EFFECTS ON:	
Recreation	Alternatives C, H, and K would increase recreation opportunities for viewing, fishing, and hunting because of the increased big-game and catchable trout populations. Elk hunting opportunity would also increase. The Current Plan will maintain these opportunities. Alternatives A-1, A-2, B-1, B-2, E-1, E,-2, F, and F (Departure) would significantly reduce these opportunities because of high levels of timber harvest and road construction. Alternative F, G (Preferred), I, and J would have slight decreases in these opportunities. Although Alternative G (Preferred) maintains elk and trout populations, elk hunter opportunity is reduced slightly, because of increased roading and timber harvest.
Wilderness	All alternatives recommend additional acres be added to the Bob Marshall-Scapegoat-Great Bear Wilderness complex. Alternatives H, I, and K recommend the most acres. Wilderness classification would ensure that these areas remain undeveloped and that native plant and animal species will be maintained with special emphasis on the preservation of threatened or endangered species and their habitat.
Range	Under Alternatives A-1, A-2, E-1, E-2, D, F, and F (Departure), range and big-game values would often be in conflict. Most winter range is also primary grazing land for livestock. If grazing increases on winter ranges, protective fencing and/or intensive grazing management systems would be needed to maintain wildlife forage supplies near current levels. Allotment management plans will limit the amount of livestock use in riparian areas.
Timber	In areas where big-game habitat is emphasized, attaining optimum cover/forage relationships and high levels of forage production require that the scheduling and distribution of timber harvest meet specified wildlife management objectives (Thomas, 1979; Lyon, 1975-1979).

Under Alternative A-1, 12,000 acres in the riparian zone would be harvested on a regulated basis. Under Alternative F and F (Departure), 1,131 acres in the riparian zone would be harvested on a regulated basis, under Alternative G (Preferred), 746 acres, and under Alternatives I and J, 390 acres.

Under other alternatives, harvest in riparian areas would be restricted to salvaging dead and dying trees. Under all alternatives, timber management in riparian areas would maintain both fisheries and wildlife habitat.

Minerals

Alternatives A-1, A-2, E-1, and E-2 would have the greatest adverse effect on wildlife as only standard stipulations are used on the Jefferson Division. Timing restrictions would not be used on important wildlife habitat. Alternatives B-1, B-2, D, F, F (Departure), G, H, I, and J are very similar and use both standard and special stipulations to protect wildlife. Only the areas available for mineral leasing vary with the alternative (see Minerals, this chapter). Alternatives C and K restricts access into primitive and semi-primitive settings and would disturb wildlife the least.

Facilities

Road construction in riparian areas requires measures to protect fishery habitat. These measures restrict the number and location of stream crossings, restrict the timing of construction to low flow seasons, and require the installation of structures which enable fish passage. These measures increase road construction costs, and decrease economic efficiency of the individual projects. All alternatives require the same mitigation measures for road construction in riparian areas; however, alternatives which schedule more timber harvest will require more construction through these types of areas.

The fishery streams on the Forest are important for the recruitment of fish to the downstream fisheries both on and off the Forest. Table 4.10 shows the catchable trout potential by alternative. The Preferred Alternative (G) maintains the catchable trout potential. However, in low gradient sections of streams off the Forest where sedimentation is the factor limiting reproductive success, it is likely that there may be a decrease of up to 5 percent in overall winter survival of young fish. The reduction in survival of young fish will translate into a similar reduction of adult trout over a few years.

Relationship with Private Land	Overall, the total carrying capacity of winter-spring ranges is the limiting factor on elk populations. Forest lands supply an estimated 50 percent of the forage during winter-spring periods. During severe winters, the amount of forage available for elk decreases significantly forcing more of the total winter-spring use on adjacent Federal, State, and private lands (Analysis of Management Situation, Lewis and Clark National Forest, 1981). Alternatives C, H, and K which would increase the elk population potential, would also affect these adjacent lands. However, because the Montana Department of Fish, Wildlife, and Parks control actual elk populations, any conflict can be avoided.
Protection	Prescribed burning to revert back to an earlier successional stage would have a long-term benefit for the wildlife resource, by maintaining a high level of forage production (Fisher and Clayton, 1982). Burning will be done when the intensity of fires can be controlled at appropriate levels, to ensure rapid resprouting and enhancement of vegetation. Wildlife management does not have a significant effect on air quality except during the spring and fall, when habitat is burned to improve forage conditions. Most wildlife habitat improvement would be accomplished by prescribed burning. (Also see Protection-this chapter.) Under all alternatives, burning would meet with State Air Quality Standards, in compliance with the Clean Air Act of Montana.
Facilities	Under all alternatives, fisheries management objectives require fish passage be provided on all bridge and culvert installations where fish spawning areas exist upstream from the construction site. In addition, construction would be allowed only during seasons when disturbance to migrating fish and spawning areas would be minimal. Road use restrictions provide big-game security from human disturbance (Flynn, 1982). Big-game management requires road use restrictions that affect public access to the Forest during the fall and winter months. Road use restrictions at other times of the year, generally in different areas, would provide security to animals in calving areas and important summer ranges.

Social and Economic	The wildlife and fish management program has both beneficial and adverse effects on the economy of the state and surrounding communities. Beneficial economic effects of intensive wildlife management would be an increase in recreation opportunity and visitors to the area, which would increase income to the local economies. Alternatives C, H, and K would provide the most benefit. Although the Forest does not receive a direct revenue from wildlife, a direct economic effect of big-game populations is license fee receipts to the State. A major source of revenue to the Montana Department of Fish, Wildlife, and Parks is big-game licenses sold to 17,000 out-of-state hunters. At $300 per license, total revenue would equal $5.1 million dollars. Wildlife habitat programs can have an adverse economic impact on timber harvesting, ranching, minerals, and oil and gas activities. The cost of doing business can increase as specific measures and structures are needed to mitigate adverse effects on T&E species, big-game populations, and other wildlife and fish.
Short-Term Use vs. Maintenance and Enhancement of Long-Term Productivity	Short-term use of resources involves continued monitoring to determine the actual effect of activities on threatened and endangered species. Should the need arise, additional restrictions may be applied to other resources to protect the involved species. Management restrictions on habitat necessary for the survival and recovery of T&E species outside of classified wilderness will likely maintain the native productivity of the area, but opportunities to enhance productivity through management may be limited. Prescribed burning for wildlife habitat improvement will change productivity. The productivity of vegetation preferable to livestock and wildlife will be enhanced. Other types of vegetation will be reduced. The improvement of the pool-riffle relationship should be a long-term benefit.
Irreversible and Irretrievable Commitment of Resources	There are few irreversible or irretrievable commitment of resources. However, so long as the grizzly bear is classified as a threatened species the management of these lands will likely remain very restrictive. Renewable resources, such as timber, that would be grown and possibly not harvested

would be irretrievably lost. Burning does not constitute an irreversible commitment of the areas to this activity. Any vegetation removed or suppressed constitutes an irretrievable loss of that resource.

Adverse Effects Which Cannot Be Avoided

Management of other resources might be somewhat limited or have slightly reduced outputs, because of T&E and other wildlife species. Burning may expose the soil surface for a few days or weeks, and there is a slight risk of accelerated erosion. Air quality degradation is similar to that from slash control (see timber harvest), but the acreage proposed for burning is small and smoke generation will be of short duration. Stream bottoms will be disturbed when structural improvements are constructed. This may have minor short-term effects on the fish and insects which occupy these areas.

Conflicts With The Objective of Other Land Management Plans, Policies, and Controls

Forest management activities are designed to avoid conflicts with all management plans and coordination programs designed to protect threatened and endangered species. However, the reduction in the elk hunter recreation conflicts with the Montana Department of Fish, Wildlife, and Parks Comprehensive Outdoor Recreation Plan (SCORP) that proposes to increase hunter opportunity on the Lewis and Clark National Forest. Coordination of wildlife habitat improvement projects with other agencies will be required to assure that state air quality standards are met.

The Blackfeet Treaty Agreement of 1896 reserved, "the right to hunt upon said lands and to fish in streams thereof so long as the same shall remain public land of the United States under and in accordance with the provision of the game and fish laws of the State of Montana", on the area referred to as the ceded lands on the Rocky Mountain Division (also see Chapter III).

Energy Requirements

Only limited energy requirements are associated with wildlife species at this time. Energy will be used in the efforts to burn and construct structural improvements. Because of the small acreage involved, this energy use will amount to only a small percentage of the total energy used on the Forest.

RANGE

The Range Management Program provides for efficient livestock grazing on forest and rangelands, commensurate with other needs. Activities include management of range permits, monitoring range use, and maintaining and constructing range improvements, such as fences and water developments. Currently the Forest provides 71,000 AUMs of grazing on 250 allotments.

Changes Between Draft and Final EIS

Information on noxious weeds and wildlife and social and economic consequences has been added in response to public concern.

Range Program

Table 4.12 shows the livestock AUMs for each alternative for the first and fifth decades. Also shown is the average annual prescribed range burning for forage production.

TABLE 4.12 RANGE PROGRAM
Planned Projected

Alternative	Thousands Of AUMs		Average Annual Range Burning For Forage Production
	First Decade	Fifth Decade	Acres
Current Plan	71.0	71.0	1398
A-1	73.0	86.4	2284
A-2	73.0	87.5	2345
B-1	73.0	81.4	1564
B-2	73.0	81.5	1552
C	71.0	70.0	1324
D	73.0	89.9	2266
E-1	71.8	84.4	2165
E-2	71.8	84.7	2010
F	71.8	79.2	1839
F-Departure	71.8	79.2	1839
G-Preferred	71.1	73.6	1641
H	71.1	64.8	700
I	71.8	73.6	1669
J	71.8	73.6	1668
K	71.1	69.9	1150

All alternatives, except C, H, and K provide an increase in livestock grazing on both Divisions of the Forest. Alternatives A-1, A-2, B-1, B-2, E-1, E-2, F and F (Departure) provide 12 to 26 percent increase. Alternatives G (Preferred), I, and J provide a slight increase. Alternatives C and K

would decrease livestock grazing slightly, and Alternative H would decrease grazing by about 9 percent. Livestock grazing increases for Alternatives E-1, E-2, and I would be on the Jefferson Division.

Range Improvement

Prescribed burning to revert the vegetation to an earlier successional stage would have a long-term benefit for the range resource, by maintaining a high level of forage production (Fisher and Clayton, 1982). Prescribed burning on non-timbered or sparsely timbered land benefits both livestock and wildlife. This burning can help prevent invasion of range lands by conifers and sagebrush and can also be used to reclaim range lands that already have been invaded. Alternatives A-1, A-2, D, E-1, and E-2 burn the most acres. Other alternatives have smaller burning programs for forage production (see Table 4.12).

Construction of fences and water developments improve livestock distribution, provide additional grazing, reduce overused areas, and improve the vigor and production of forage (Greene, 1973). However, fencing is also responsible for livestock trailing along fences. Fences can deter natural movement of wildlife and other users (snowmobiles and horseback riders). Proper fence design and adequate gate numbers and locations can help mitigate these impacts. Water developments can also be used by wildlife and Forest visitors for stock water.

Currently, the Forest treats approximately 200 acres of noxious weeds annually. This is expected to increase in the future. Control of noxious weeds increases production of desirable forage species, by reducing competition. All chemical control of noxious weeds is with approved chemicals that are hand applied. An environmental analysis is made for each proposed project following NEPA and other legal requirements. This reduces the potential for adverse effects. Biological weed control agents are also being utilized as they become available in an intergrated pest management effort.

EFFECT ON:

Recreation

Some grazing impacts include conflicts with recreationists, especially in heavily used recreation areas (Paulsen, 1975). Alternatives

with the highest grazing output, A-1, A-2, and D would create the most conflict. Fences, gates, and cattleguards can minimize conflicts with developed recreational use. Grazing may annoy some recreationists because of smells, flies, visibility, noise and manure on trails and around campsites.

Wildlife

Livestock grazing can have an adverse effect on big-game habitat; primarily where grazing occurs on riparian zones and winter range. This would cause a long-term effect on big-game, because the amount of winter range is a limiting factor for big-game populations (Mussell and Howell, 1971). This is especially critical for elk and bighorn sheep populations. Alternatives A-1, A-2, and D affect the most acres of elk winter range resulting in a decrease in elk population potentials.

Under all alternatives, adverse effects on elk populations could also occur on summer ranges where social competition between livestock and elk can be a problem (Thomas and Toweill, 1982). Big-game tend to avoid areas occupied by cattle and some competition for forage may exist (Nelson and Burnell, 1976). These conflicts are expected to be insignificant from a total Forest perspective because of the vast acreage of summer ranges. However, late season livestock grazing in spring big-game range can help cause early greenup, which benefits big-game during calving. There is also substantial evidence that cattle do not always repel elk (Wand, 1973; Wand et al., 1973; Wand and Cupoal, 1979). The nature of elk-cattle competition is far more complimented than had been suspected and further research is necessary so conflicts between elk and cattle can be described (Lyon, 1985). The opportunity to effectively mitigate adverse impacts upon big-game decrease as livestock allocations increase.

Grizzly bear can be adversely affected when they have to compete with livestock for desirable forage (Schallenberger and Jonkel, 1980). Alternative D would increase livestock grazing significantly on the Rocky Mountain Division. Alternatives A-1, A-2, B-1, B-2, F, and F (Departure) would also increase livestock grazing on the Rocky Mountain Division. Grazing under Alternatives C, E-1, E-2, H, I, and K would not increase. A small increase in livestock grazing is provided for in Alternatives G (Preferred), and J on the T&E species habitat.

	Intensive livestock grazing systems can mitigate forage competition. Mitigation measures include timing restrictions to avoid primary grizzly bear use periods, scheduling of concurrent activities to distribute human use levels over large areas, and the use of structural improvements, as needed, to protect seasonally important habitats. Although effective coordination is expected to minimize both direct and indirect impacts, mitigation measures would not eliminate all the projected adverse effects.
Timber	Transitory range is created by timber harvest and under some conditions will be available to livestock. Although the quality of transitory range varies by habitat type, alternatives that harvest more timber provide more transitory range. All alternatives include livestock grazing of transitory range. Assuming forage use is not excessive, livestock grazing would not adversely affect timber production in all alternatives (McLean and Clark, 1980; Hann, 1981). Burning of trees encroaching into rangelands should not have a significant effect on future timber production because the areas are marginal timber producing sites.
Soil, Water, and Fish	Grazing may compact the soil, reduce soil moisture and stream stability, and impact water quality and overland flow through removal of protective cover through trampling disturbance (Gifford, 1981). With proper management of cattle grazing, soil erosion will not be a problem under any alternative. Riparian areas are usually grazed first. Fish habitat and water quality may be affected because of the availability of shade and water, breaking down streambanks, increasing sediment through reduced vegetation and overland flow, increasing nutrient levels of the water. Direct damage to the fishery can occur when livestock walk in the streams causing stream bottom disturbance, increased turbidity, and destruction of trout eggs and fry (Peek and Dalke, 1982; Platts, 1978). These impacts can be reduced significantly through proper range management and fences. Mitigation measures are listed in the management practices and standards for grazing in riparian areas (see Forest Plan).

Social and Economic	While the percentage of grazing provided by the Forest is not large in comparison with non-Federal range, the increases in Forest grazing would have economic benefit to the livestock industry (USDA Interagency Work Group, 1974). All alternatives, except C, H, and K increase livestock grazing to provide more beef, lamb, and wool to the consumer. This would increase income to the local livestock industry and increase receipts to the U.S. Treasury. Grazing fees collected do not offset the costs of the program. However, livestock grazing is very important to the local economies, this includes direct effects to the ranchers, indirect effects to those who supply the ranching industry, and induced effects to those providing common retail goods and services to the first two groups. The increase in grazing opportunity over time has a beneficial effect upon the ranching operations by assuring a constant supply of grazing land. The feeling of certainty about future supply will enhance lifestyles and grazing opportunities for ranchers (see Table 4.39 at the end of this chapter). Since the increase in livestock grazing under Alternatives G (Preferred), I, and J are very small, the beneficial effects under these alternatives will also be very small.
Short-Term Use vs. Maintenance and Enhancement of Long-Term Productivity	Grazing management activities can increase the long-term productivity of forage on the Forest. As allotments come under management plans and improvements are implemented, an increase in production should be realized. A few small areas near watering places and salt will continue to be overused, changing the vegetation productivity of these areas.
Irreversible and Irretrievable Commitment of Resources	There is a long time tradition and need of ranchers to graze on the Forest. As long as this exists, it is unlikely that all livestock wil be removed from the Forest. Forage grazed by livestock is a commitment of that resource.
Adverse Effects Which Cannot Be Avoided	The potential for conflict between big-game and livestock will continue. Facilities (fences and water developments) on rangelands will affect the visual resource. Recreationists will continue to be annoyed by smells, flies, sounds, and manure in some areas. Vegetation change will continue to occur in heavily used areas. Fish habitat and water quality will be adversely affected. All these adverse effects are minor and local in nature.

Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	No conflicts have been identified.
Energy Requirements	Energy required by the Forest in livestock management is not great. Some energy may be required in monitoring the resource and in maintaining facilities. This will not be a significant portion of the total energy used on the Forest. Permittees will also use energy in managing livestock while on the Forest and in moving livestock to and from Forest rangelands.

TIMBER

The Timber Management Program ensures the growth and use of timber for the Nation's benefit. Activities include the scheduling of timber harvest, administration of timber sales, timber stand improvements such as thinning, and the reforestation of harvest sites through site preparation and planting. Wood products are made available to sawmills, local users, and firewood cutters. Road construction and maintenance, an activity closely associated with timber harvest, is discussed later in the chapter under Facilities. The current timber sale program is 13 million board feet per year.

Changes Between Draft and Final EIS

Information on productivity, silvicultural systems, slash disposal, site preparation, reforestation, and timber stand improvement has been added in response to public concern. The consequences of visual quality, wilderness, wildlife, soil, water, riparian areas, protection, and social and economic has been expanded in response to public concern.

Timber Sale Program

Table 4.13 gives timber sale program quantity by alternative for the first five decades.

TABLE 4.13 ANNUAL TIMBER SALE PROGRAM (Million of Board Feet)

Planned Projected

Alternative	First Decade	Second Decade	Third Decade	Fourth Decade	Fifth Decade
Current Plan	13.0	13.0	13.0	13.0	13.0
A-1	20.0	30.0	34.0	37.0	41.0
A-2	20.0	30.0	34.0	37.0	41.0
B-1	14.0	18.2	20.3	21.8	23.7
B-2	14.0	18.2	20.3	21.8	23.7
C	12.5	12.5	12.5	12.5	12.5
D	12.5	12.5	12.5	12.5	12.5
E-1	14.0	17.0	22.8	28.2	33.1
E-2	14.0	17.0	22.8	28.2	34.0
F	14.0	17.0	20.0	23.0	24.0
F-Departure	15.5	20.1	27.1	28.1	26.6
G-Preferred	14.0	17.0	20.0	20.0	20.0
H	14.7	16.6	18.6	20.5	22.4
I	13.0	17.0	20.0	22.0	22.0
J	13.0	17.0	20.0	22.0	22.0
K	12.4	12.4	12.4	12.4	12.4

Alternatives A-1, A-2, E-1, and E-2 have the largest timber sale program. Alternatives B-1, B-2, F, F (Departure), G (Preferred)*, H, I, and J would almost double the program. Alternatives C, D, and K maintain the program at about the current level. Most of the harvest would take place on the Jefferson Division.

*Note: The overall timber sale program has been reduced slightly from the DEIS-Supplement (30 million board feet over 50 years). However, the program on the Jefferson Division has not changed, although there has been a slight change in the harvest schedule.

A small timber sale program is proposed under all alternatives except E-1, E-2, and H for the Rocky Mountain Division. Annual programs would vary from .7 million board feet for Alternatives C, D, and K, to 1.5 million board feet for Alternatives F and F (Departure). Alternatives I, and J have a 1.0 million board feet small sales program. Alternative G (Preferred)* has a 0.5 million board feet program. This program would meet the local needs for posts, poles, houselogs, firewood, and other wood products.

*Note: This program has been reduced 0.5 million board feet from the DEIS-Supplement.

Suitable Acres

The acres suitable for timber production are the portion of the Forest where regulated timber harvest is scheduled. The alternative with the largest acreage of suitable land has the potential to produce the most timber. The alternative with the smallest suitable acreage would provide the least timber. Table 4.14 list the suitable timber acres by alternative.

TABLE 4.14 SUITABLE TIMBER ACRES

Alternative	Acres
Current Plan	195,553
A-1	473,414
A-2	541,678
B-1	452,806
B-2	466,071
C	209,364
D	226,762
E-1	433,691
E-2	534,186
F	286,042
F-Departure	308,872
G-Preferred	282,307
H	254,796
I	280,501
J	280,720
K	201,872

Management Intensity

The intensity of timber management applied to a given area is a function of the economic efficiency analysis conducted by the FORPLAN computer model. Management activities are scheduled over time and applied to a given stand of timber so that the monetary investment maximizes the returns in timber volume and value within the 150-year planning period. Three intensities of management are considered.

- Low intensity timber management would produce volume by an unmanaged stand. The economic analysis indicates that for some stands of a certain age at a specific decade in the planning period, additional investments in management activities do not increase the benefits. Only a final harvest is scheduled.

- Moderate intensity management schedules one precommercial thinning and one intermediate harvest prior to the final harvest, to increase the volume and value.

- High intensity timber management schedules one precommercial thinning and two intermediate harvests prior to the final harvest.

The intensity of timber management can change over time, between the management of the existing stand and the future (regenerated) stand. Higher management intensities require higher levels of funding. In most cases, regenerated stands would be managed at moderate or low intensities under all alternatives.

Alternatives A-1, A-2, and E-1 have a high management intensity and require large precommercial thinning programs. Alternatives A-1 and E-1 require higher amounts of precommercial thinning, because the MWSA areas are designated for wilderness and unavailable for timber harvest. Alternatives B-1, B-2, E-2, G (Preferred), H, I, J, and K have moderate precommercial thinning programs. Alternatives C, D, F, F (Departure), and the Current Plan have smaller precommercial thinning programs (see Table 4.18).

Annual sale volume varies according to the management intensity and the acres allocated to timber management (See Table 4.13 and 4.14). Volume is increased over time as a result of silvicultural practices (see Table 4.18).

Productivity

The Timber Management Program can have an overall effect on the productivity of the timber resource. This productivity can be expressed as the percent of growth of LTSYC (long-term sustained yield capacity). Table 4.15 shows the LTSYC and Growth at 2030.

TABLE 4.15 LONG TERM SUSTAINED YIELD CAPACITY AND GROWTH AT 2030

Alternative	LTSYC Million Board Feet (Million Cubic Feet)	GROWTH Million Board Feet (Million Cubic Feet)	GROWTH/ LTSYC Percent
Current Plan	14.3(4.2)	1.7(.5)	12
A-1	41.1(12.1)	19.5(5.7)	47
A-2	43.5(12.8)	15.0(4.4)	34
B-1	32.6(9.6)	9.2(2.7)	28
B-2	33.6(9.9)	8.5(2.5)	25
C	18.3(5.4)	4.7(1.4)	31
D	16.0(4.7)	6.1(1.8)	37
E-1	34.6(10.2)	12.5(3.7)	36
E-2	39.8(11.7)	10.6(3.1)	27
F	25.4(7.5)	12.6(3.7)	50
F-Departure	26.8(7.7)	13.3(3.9)	51
G-Preferred	23.8(7.0)	6.2(1.8)	26
H	23.7(7.0)	8.4(2.5)	35
I	20.3(6.0)	6.2(1.8)	30
J	20.3(6.0)	5.9(1.7)	29
K	14.4(4.2)	5.5(1.6)	38
Max PNV	43.8(12.9)	16.5(4.8)	38

The percent of growth of LTSYC varies from 12 percent (Current Plan) to 51 percent (Alternative F - Departure). The "Revised President's Statement of Policy" calls for commercial timberlands to have been brought to and maintained at, where possible, 90 percent of LTSYC by 2030 consistent with the provisions of NFMA.

This could not be achieved under any alternative due to the Forest's age structure. Much of the timberland was burned by wildfire at the turn of the century. This land has regenerated and now is approaching, or has just reached, culmination of mean annual increment. Therefore, the overall growth is very high now and will be for the next two decades. Growth then declines around 2030.

For example, under Alternative F growth is calculated at 65 percent of LTSYC at 1995 and then drops to 50 percent at 2030. After 2030, growth increases under all alternatives because stands harvested in the first few decades regenerate and begin rapid growth.

For Alternative G (Preferred) to achieve 90 percent of LTSYC by 2030 would require departure from the harvest schedule. However, this would only increase the growth to 51 percent, as shown by F (Departure). Even the maximum timber benchmark does not achieve growth at 90 percent of LTSYC at 2030, and it departs from non-declining sustained yield. Even though large acreages of mature stands are harvested in the first few decades of the maximum timber benchmark, these acres do not contribute large volumes of growth until after 2030.

Silvicultural Systems

Three silvicultural methods for regeneration harvest are appropriate for the Lewis and Clark National Forest: clearcutting (including seed tree cutting), shelterwood, and selection/group cutting.

In most cases, even-aged silviculture (clearcut and shelterwood) will be practiced to achieve the management objectives of the alternatives. Clearcutting is used in conformance with NFMA regulation and the Northern Regional Guide. Clearcutting is generally used in the lodgepole type (general forest). Shelterwood is generally used in the Douglas fir type (dry forest). Uneven-aged silviculture (selection cutting) is used primarily in riparian areas and other special areas. The silvicultural system designed for each management prescription considers landtype, habitat type, tree species, and timber condition class. The acres harvested under each system by alternative are shown in Table 4.16.

Uneven-Aged Management

Uneven-aged silviculture is applied on relatively small, high value areas because widespread long-term application is incompatible with the natural even-aged vegetative communities of the Lewis and Clark National Forest (Habeck and Mutch, 1973). Uneven-aged management maintains vegetative cover for wildlife species and provides opportunities for management of specific wildlife habitats. Uneven-aged silviculture is well suited for areas such as riparian zones where continous tree cover is desired.

The current stand age classes lend themselves well to even-aged management, and relatively few stands currently exist with age structures that are suitable for uneven-aged silviculture (Hahn and Bare, 1979). Attempts to create all-aged stand structures from even-aged stands over time results in loss of shade intolerant species such as ponderosa pine and which cannot reproduce in shade.

Buildup of fuels as a result of uneven-aged management inevitably predisposes the stands to fire. Multistoried stands composed of shade tolerant species are also predisposed to natural insect and disease pathogens such as spruce budworm and root rots. Insect and disease problems are compounded by damage to the residual stand and to soils from frequent logging entries which are necessary to implement uneven-aged systems. Frequent logging entries are also disturbing to important Forest wildlife species such as grizzly bear, gray wolf, and elk.

These facts were considered early in the Forest planning process and incorporated into vegetative management standards (see Forest Plan, Appendix A). These standards were used as minimum management requirements for the formulation of alternatives. Extensive use of uneven-aged silviculture systems was considered for the Lewis and Clark National Forest and found to be ecologically unsound. As a result, no Forest Plan alternatives were developed in detail featuring selection systems. FORPLAN analysis data for application of selection systems indicates it is not a cost-effective timber harvest method on the Lewis and Clark National Forest. Uneven-aged silviculture is appropriate for relatively small local areas when other resource values are high such as riparian areas.

Even-Aged Management

Even-aged silvicultural regeneration methods were found to be appropriate for the majority of the vegetative types on the Lewis and Clark National Forest because they produce environments that most native tree and other important vegetation require.

Even-aged silviculture is cost-effective for timber management. Good opportunities are provided for the economical application of prescribed fire and other cultural treatments designed to maintain insect and disease resistent stands. If proper Forest management practices are not followed, even-aged silviculture can result in the increased risk of soil erosion and degraded water quality because removal of the Forest canopy exposes soil and increases water yiel

The effects of even-aged silviculture are in large part dependent on site-specific conditions and management objectives. For example, clearcutting to open the Forest canopy and allow more sun to reach the ground, in combination with broadcast burning, may produce favorable regeneration opportunities on a cool, wet site. On the other warm, dry site clearcutting and broadcast burning may increase temperature and reduce soil moisture to the point that trees cannot survive.

TABLE 4.16

SILVICULTURAL SYSTEMS (Acres)

Projected

Planned

	First Decade	Second Decade	Third Decade	Fourth Decade	Fifth Decade
Current Plan					
Clearcut	840	705	554	737	731
Shelterwood Regen. Cut	571	478	376	500	497
Overwood Removal	200	300	571	478	376
Selection	0	0	0	0	0
A-1					
Clearcut	961	1522	1301	1661	1754
Shelterwood Regen. Cut	1133	1794	1543	1958	2074
Overwood Removal	200	300	1133	1794	1534
Selection	1250	1250	250	1250	1250
A-2					
Clearcut	1002	1441	1538	1772	1790
Shelterwood Regen. Cut	1314	1887	2016	2322	2344
Overwood Removal	200	300	1314	1887	2016
Selection	90	90	90	90	90
B-1					
Clearcut	728	985	932	1413	1603
Shelterwood Regen. Cut	803	1085	1028	1556	1766
Overwood Removal	200	300	803	1025	1028
Selection	0	0	0	0	0
B-2					
Clearcut	849	1191	1080	1469	1430
Shelterwood Regen. Cut	843	1182	1072	1458	1420
Overwood Removal	200	300	843	1182	1072
Selection	0	0	0	0	0
C					
Clearcut	756	635	474	758	731
Shelterwood Regen. Cut	677	569	424	679	655
Overwood Removal	200	300	677	564	424
Selection	0	0	0	0	0
D					
Clearcut	806	791	516	590	620
Shelterwood Regen. Cut	718	705	460	525	552
Overwood Removal	200	300	718	705	460
Selection	60	60	60	60	60
E-1					
Clearcut	685	855	991	1302	1722
Shelterwood Regen. Cut	835	1043	1208	1586	2097
Overwood Removal	200	300	835	1043	1208
Selection	0	0	0	0	0
E-2					
Clearcut	694	819	1077	1298	1687
Shelterwood Regen. Cut	1124	952	1476	1779	2311
Overwood Removal	300	200	952	1124	1476
Selection	0	0	0	0	0
F					
Clearcut	794	833	814	1230	1157
Shelterwood Regen. Cut	787	827	808	1220	1147
Overwood Removal	200	300	787	827	808
Selection	1930	1930	1930	1930	1930
F-Departure					
Clearcut	1177	1348	1075	1164	1064
Shelterwood Regen. Cut	1083	1240	989	1071	978
Overwood Removal	200	300	1083	1240	989
Selection	1930	1930	1930	1930	1930
G-Preferred					
Clearcut	631	603	752	1041	739
Shelterwood Regen. Cut	836	799	997	1380	980
Overwood Removal	200	300	836	799	997
Selection	60	60	60	60	60
H					
Clearcut	643	612	677	764	1072
Shelterwood Regen. Cut	852	811	897	1012	1421
Overwood Removal	200	300	852	811	897
Selection	22	22	22	22	22
I					
Clearcut	629	604	750	1023	655
Shelterwood Regen. Cut	834	801	994	1356	869
Overwood Removal	200	300	834	801	994
Selection	63	63	63	63	63
J					
Clearcut	631	603	743	1040	641
Shelterwood Regen. Cut	836	799	986	1378	849
Overwood Removal	200	300	836	799	986
Selection	63	63	63	63	63
K					
Clearcut	605	416	459	574	306
Shelterwood Regen. Cut	802	552	608	761	512
Overwood Removal	200	300	802	552	608
Selection	63	63	63	63	63

Appropriate Silvicultural Systems

Appropriate silvicultural systems for the Lewis and Clark National Forest include:

Lodgepole Pine Types: Clearcutting is the preferred and predominant Regeneration Harvest System in the lodgepole pine timber type. Other Regeneration Harvest Systems (selection, shelterwood, seed tree or variations) may be prescribed, where appropriate, to meet on-site constraints.

Mixed Lodgepole Pine Timber Types: In contrast to the essentially pure lodgepole pine timber types, these mixed lodgepole pine types contain other species mixtures in innumerable variations. Removal of the entire merchantable lodgepole pine component is the preferred and predominant Regeneration Harvest System in these mixed lodgepole pine timber types.

Douglas Fir Timber Types: These types range from essentially pure Douglas fir to other species mixtures in innumerable variations. Maintenance of the key species mixture along with the Douglas fir may be a major treatment objective, if the habitat type is favorable for further establishment and growth of these species. In order to provide for the maintenance or improvement of species diversity on appropriate sites, shelterwood trees or in some cases seed trees, should be reserved to provide an on-site seed source for natural regeneration.

Subalpine Fir Timber Types: These are the timber types that have progressed through the seral stages and contain principally climax subapline fir and other associated species, such as lodgepole pine, Engelmann spruce, etc. Treatments would be similar to those in the lodgepole pine timber types.

Spruce Timber Types: The spruce timber types are located in part on hydric sites, in or adjacent to riparian areas, wet marshes or high water table areas. The maintenance of the existing stand characteristics on these wet sites are important wildlife objectives. Single tree or group selection regeneration treatments will be the principal harvest method in these timber types because of potential water table problems that may develop when the transpirational surface of the timber canopy is reduced due to timber harvest. In the more well drained habitat types, where rising water table problems are likely to develop, even-aged regeneration systems can also be applied.

Ponderosa Pine Timber Types: A significant portion of the ponderosa pine on the Forest is located on sites where Douglas fir is the climax species and ponderosa pine is a long lived seral associate. On these sites, manage for a good mixture of ponderosa pine, Douglas fir, and other associated species common to the habitat types. When ponderosa pine is the climax species, the shelterwood regeneration system with natural regeneration specified will be the primary regeneration harvest method. The selection system is also a viable regeneration harvest method if needed to meet functional objectives other than timber management.

The actual silvicultural system that will be used is dependent on a site-specific silvicultural examination and prescriptions based on stand composition and condition. (See Management Standard E-4, Timber Harvest, and Appendix A, Forest Plan.)

Logging Systems

Logging system options include tractor, ground lead, and skyline systems. The appropriate logging system is determined by slope and soil sensitivity. Slopes of 45 percent and less are generally logged by tractors. Slopes of 45 percent or greater are generally logged by ground lead or skyline systems. Tractor skidding will be used most during the first five decades. A higher percentage of cable skidding would occur in later decades, as more harvest is on steeper slopes where costs are higher. Horses or special equipment can be used to log special areas to protect unique values.

Slash Disposal

One objective of slash disposal and fuels management is to maintain fuel loading within acceptable limits for prevention and control of wildfires. Often the same activities help prepare the site for regeneration. Slash may be tractor piled and burned on gentle slopes. It can be hand piled and burned or broadcast burned regardless of slope. In some situations where slash is not evenly distributed and a mature overstory has been left, underburning of concentrations of slash is the only effective method of slash disposal. In some situations the unmerchantable tops can be taken to a landing for burning. Although burning is most often a part of slash control, where logging or thinning debris is light, lopping and scattering of this material is an acceptable method of hazard reduction. The gathering of slash material for firewood is a method of slash control that is becoming more common. Table 4.17 shows the average annual activity fuel treatment program.

TABLE 4.17 AVERAGE ANNUAL ACTIVITY FUEL TREATMENT (Acres)

Alternative	Activity Fuel Program
Current Plan	1393
A-1	3143
A-2	3294
B-1	2367
B-2	2382
C	1497
D	1300
E-1	2503
E-2	2672
F	2230
F-Departure	2033
G-Preferred	1750
H	1753
I	1703
J	1701
K	1135

Alternatives which harvest the most timber (A-1, A-2, B-1, B-2, E-1, E-2, F, and F-Departure) have the greatest activity fuel treatment.

Site Preparation

The objective of site preparation is to create micro-sites where tree seedlings have a good chance for survival. Site preparation requires the removal of competing vegetation and exposure of mineral soils. Seeds and seedlings planted in organic matter and duff dry out and fail to survive.

Site preparation usually occurs as part of logging and slash disposal activities.

Site preparation can also be achieved by handscalping. Handscalping of the individual tree planting sites is the least costly method of site preparation. It is also least effective because less competing vegetation is removed and seedling failure is high.

A minor amount of herbicides may be used for site preparation in a way similar to hand scalping. This would only be done with approved herbicides and would be hand applied. An environmental analysis is made following NEPA and other legal requirements for each proposed project. They would not be used in riparian zones. These constraints reduce the potential for adverse effects. Normally herbicides would be used after other means of site preparation failed.

Reforestation

Reforestation occurs after harvest, slash disposal, and site preparation are completed. Natural regeneration is abundant on most harvest areas. Dry forest sites do require about 15 percent of the site to be hand planted where regeneration failures have occurred and in shelterwood areas where the remaining trees are heavily mistletoed. (Analysis of Management Situation, Lewis and Clark National Forest, 1981.) Table 4.18 shows the amount of site preparation and reforestation by alternative.

TABLE 4.18 SITE PEPARATION AND REFORESTATION (Natural and Planting Acres)

Projected
Planned

Alternative	First Decade	Second Decade	Third Decade	Fourth Decade	Fifth Decade
Current Plan	1200	1200	1200	1200	1200
A-1	2094	3316	2835	3619	3833
A-2	2316	3328	3554	4094	4134
B-1	1531	2070	1960	2969	3369
B-2	1692	2373	2152	2927	2850
C	1433	1204	898	1437	1386
D	1524	1496	976	1115	1172
E-1	1520	1898	2199	2888	3819
E-2	1646	1943	2553	3077	3998
F	1581	1660	1662	2450	2304
F-Departure	2260	2064	2235	2042	2042
G-Preferred	1470	1410	1750	2020	1450
H	1495	1423	1574	1776	2493
I	1463	1405	1744	2379	1524
J	1467	1402	1729	2418	1490
K	1407	968	1067	1335	898

The site preparation and reforestation program reflects the level of timber harvest by alternative (see Table 4.13). Alternatives which harvest the most timber (A-1, A-2, B-1, B-2, E-1, E-2, F, and F-Departure) have the greatest site preparation and reforestatoin programs.

Timber Stand Improvement

Precommercial and commercial thinning, and silvicultural burning are two activities associated with timber stand improvement. Precommercial thinning occurs when the regenerated stand is generally between 20 and 40 years old. The amount of precommercial thinning varies by habitat type harvested, prescription, and area harvested. Silvicultural burning is done on ponderosa pine stands. The objective of these practices is to reduce competition among crop trees, so maximum growth per tree is realized. The resulting fewer but larger trees are more valuable at time of harvest.

Table 4.19 shows the average annual amount of precommercial and commercial thinning planned for the first five decades.

TABLE 4.19 THINNING PROGRAM (Acres)

Planned Projected

Alternative	First Decade		Second Decade		Third Decade		Fourth Decade		Fifth Decade	
	P	C	P	C	P	C	P	C	P	C
Current Plan	165	100	170	100	211	100	137	100	140	100
A-1	1074	100	1454	100	1258	100	2270	100	2041	100
A-2	764	100	1099	100	1191	100	2250	100	1641	100
B-1	122	100	166	100	138	100	409	100	176	100
B-2	238	100	322	100	175	100	672	100	522	100
C	192	100	161	100	97	100	110	100	372	100
D	215	100	211	100	137	100	409	100	81	100
E-1	613	100	601	100	151	100	672	100	522	100
E-2	198	100	235	100	148	100	237	100	780	100
F	126	100	133	100	130	100	196	100	184	100
F-Departure	126	100	133	100	186	100	306	100	234	100
G-Preferred	200	100	200	100	220	100	210	100	260	100
H	200	100	200	100	224	100	213	100	236	100
I	200	100	200	100	219	100	211	100	262	100
J	200	100	200	100	220	100	320	100	259	100
K	175	100	175	100	211	100	145	100	160	100

P= Precommercial Thinning C= Commercial Thinning

Alternative A-1 and A-2 which have the largest timber sale program also have the largest precommercial thinning program. Alternatives B-2, E-1, E-2 have moderate programs, again because of larger timber sale programs. Other alternatives have small precommercial programs. All alternatives have a small commercial thinning program. Larger thinning programs are not cost-effective.

Table 4.20 shows the annual silvicultural burning program for composition and stocking control.

TABLE 4.20 BURNING FOR COMPOSITION AND STOCKING CONTROL (Acres)

Alternative	Average Annual Program
Current Plan	0
A-1	94
A-2	110
B-1	115
B-2	204
C	0
D	0
E-1	100
E-2	150
F	70
F-Departure	84
G-Preferred	20
H	70
I	70
J	70
K	0

Alternatives A-1, A-2, B-1, B-2, E-1, E-2, F, F-Departure, H, I, and J all have small burning programs for stocking control. The Preferred Alternative (G) would burn about 20 acres in the Little Snowy Mountains to control stocking levels on the ponderosa pine type.

EFFECTS ON:

Recreation

Existing recreation settings are changed by developments associated with timber management, such as timber harvest and road construction. These activities increase some recreational opportunities and disrupt others. Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 would develop the most land into roaded natural settings. Alternatives C, D, F, F (Departure), and Preferred Alternative (G) would maintain large areas in a semi-primitive recreation setting. Alternatives H, I, J, and K would manage large areas in a primitive setting by recommending wilderness classification.

Recreational disruption and noise of logging operations cause local, short-term degradation to the recreation experience. In alternatives with low timber sale programs levels, the disturbance will be minimal, because only a few timber sales will be active at any one time and these are likely to be scattered throughout the suitable timberland. In alternatives with high timber harvest levels (A, B, and E) there will be more numerous sales and the effect will be concentrated.

Visual Quality

Timber management activities have significant impacts on visual quality. These activities, including timber harvest, slash disposal, and thinning, will change the existing landscape. Although the impacts of timber management are generally short-term, the immediate change to the existing landscape is undesirable to many Forest visitors. Slash disposal by burning can cause short-term degradation of foreground viewing. In broadcast burning units, all residual vegetation is usually burned and the unit looks scorched and black. Visual degradation usually lasts only until the first growing season, because forbs, grasses, and shrubs resprout or seed and grow rapidly after fire. Burned dozer piles leave scars that are readily visible. Burned handpiles are virtually invisible to the casual observer after a short time. Hot underburns can cause scorch marks on trunks of the remaining overstory and can kill lower branches.

Precommercial thinning can have a minor adverse effect on viewing from the foreground until the slash decays or is otherwise disposed of. The more open aspect of the thinned stands are not likely to be noticed by the casual observer.

The degree to which the landscape can be altered is defined by the visual quality objectives for the area. The greatest visual impact would occur in the high timber management alternatives where large areas are assigned to the modification visual quality objectives. Alternatives A-1, A-2, E-1, and E-2 could adversely affect driving for pleasure because of a decrease in visual quality resulting from increased timber harvest in visually sensitive zones. Other alternatives would have less significant impacts on the visual resource.

Logging and road construction near Glacier National Park not only causes a negative visual impact but also affects animal movement patterns by opening the Forest. (Glacier National Park Natural Resources Management Plan and Environmental Assessment, 1983.)

U.S. Highway 2, a railroad, private land and considerable development separates Glacier National Park from the Lewis and Clark National Forest. The area seen from U.S. Highway 2 would be managed to maintain the visual resource.

Wilderness

Timber management reduces the naturalness of the areas and is most often associated with road building, thus reducing wilderness and roadless potential. Table 4.21 shows the amount of currently roadless lands which would be developed for timber management.

TABLE 4.21 ROADLESS AREA DEVELOPED (Thousand Acres)

Planned Projected

Alternative	First Decade	Fifth Decade	Fifteenth Decade
Current Plan	-26	-263	-408
A-1	-42	-413	-691
A-2	-42	-603	-881
B-1	-26	-486	-630
B-2	-26	-463	-684
C	-16	-147	-208
D	-14	-203	-263
E-1	-26	-418	-468
E-2	-26	-490	-654
F	-26	-223	-223
F-Departure	-28	-225	-225
G-Preferred	- 7	- 93	- 93
H	0	- 19	- 19
I	-12	-117	-117
J	-15	-146	-146
K	- 8	-104	-104

All alternatives reduce the roadless acreage for timber management. Alternative A-1, A-2, B-1, B-2, E-1, E-2, and the Current Plan have large acreages of roadless land that would be developed for timber management. Alternatives C, D, F, F-Departure,

G-Preferred, I, J, and K have less acres that will be developed. Under Alternative H, only a part of the Badger-Two Medicine roadless area on the Rocky Mountain Division will be developed.

Wildlife

Manipulation of Forest vegetation through timber management activities directly impacts animal communities. As the availability of timber condition classes change, the diversity and abundance of wildlife species will change (Thomas, 1979). Timber harvest provides a cost-effective way of increasing wildlife forage and habitat diversity by creating different age classes of trees.

Timber management activities can adversely affect big-game if there is not enough forage or if forage cannot be used because cover is inadequate. Timber harvesting reduces hiding and thermal cover, which primarily impacts big-game fall ranges. As roads are constructed and timber cover is removed, habitat security for elk is reduced. This in turn reduces hunting opportunity. The greatest potential for conflict exists in the Little Belt and Castle Mountains (Analysis of Management Situation, Lewis and Clark National Forest, 1981). Road management and maintenance of effective cover can mitigate these impacts. Elk hunting opportunity is shown in Table 4.22.

TABLE 4.22 ELK HUNTER RECREATION (Thousand Hunter Days)
Projected
Planned

Alternative	First Decade	Fifth Decade
Current Plan	63.9	63.9
A-1	63.9	50.4
A-2	63.3	51.6
B-1	63.9	56.3
B-2	63.9	56.3
C	63.9	71.9
D	62.9	56.9
E-1	63.5	55.0
E-2	63.9	53.0
F	63.9	60.1
F-Departure	63.9	57.3
G-Preferred	63.7	60.2
H	63.0	67.0
I	63.4	61.2
J	63.7	60.5
K	63.9	71.9

Alternatives C, H, and K would have an increase in elk hunter recreation as less roadless acres would be impacted and grazing levels would be reduced.

These effects on elk hunter recreation would be the greatest under Alternatives A-1, A-2, B-1, B-2, D, E-1, and E-2 because of high timber harvest and grazing levels and development of roadless lands. Under Alternatives F, F-Departure, G-Preferred, I, and J elk hunter recreation would also be reduced, but the effects are not as significant.

On big-game winter range, timber harvest can improve the level of forage production and provide the optimum relationship of tree cover to forage areas (Lyon, 1975-79; Thomas, 1979). Timber harvest on big-game winter range will be designed and scheduled to meet wildlife objectives.

Wildlife species that prefer openings or sparse canopies will find more suitable habitat, and those species preferring dense canopies or older growth trees will find less. Edges are created for those species that rest or hide in dense canopies and feed in the openings. Rapid regeneration causes livestock and wildlife forage to decrease somewhat sooner because of shading and competition of the growing trees, but also speeds the process of recovery of big-game hiding and thermal cover.

Human use, equipment operation, and other noises associated with timber harvesting activities could have a short-term adverse effect on the distribution of wildlife.

All alternatives, except E-1, E-2, and H harvest timber on grizzly bear habitat. The Preferred Alternative (G) has the smallest program (0.5 million board feet). Permanent roads will not be constructed under this program. Timber management can be used to create favorable quality, quantity, and distribution of forage areas for grizzly bears. However, unless carefully designed and scheduled with restricted road use, timber management can adversely impact grizzly bear and gray wolf habitat (Jonkel, 1975; Ream, 1978). Major indirect impacts upon grizzlies would result from high levels of human use associated with timber harvest activities. The short-term effects of increased human use would displace grizzly bears in portions

of occupied grizzly bear habitat. Standards have been established which maintain escape cover and a degree of isolation for the grizzly bear so that adverse affects can be mitigated (see Forest Plan).

The gray wolf's food source could indirectly benefit by timber harvesting, which provides more transitory forage for their major prey: deer and elk. The gray wolf, like the grizzly bear, would be affected by human use associated with timber harvesting. These effects can also be mitigated through Forest Plan Standards.

Timber effects on fish populations are a result of changes in water quality, discussed under soil, water, and riparian areas on the following pages. Effects of increased sedimentation levels in the streams, from roads constructed for timber harvesting, is discussed under Facilities.

A totally clean forest floor lacks cover for a wide variety of small animals, many of which depend on insects for food. The removal of all dead, down, and decaying logs removes a whole segment of the forest ecosystem. The objective of slash disposal and site preparation includes provisions for leaving sufficient woody material to support the full complement of organisms present in the forest ecosystem, provide for recycling of material and the creation of microsites for seedlings.

Firewood cutters remove trees that are important to cavity nesting birds and other wildlife species. Standards have been established to retain snags and down trees and educate the public on their importance. Where necessary, signs will be used to mark essential snags as "Wildlife Trees".

Diversity

All alternatives provide adequate old-growth and grass/forb stage habitat to sustain viable populations of dependent wildlife species. Old-growth will be provided by wilderness, semi-primitive recreation setting, and riparian areas under all alternatives.

Old-growth habitat dependent species are most sensitive to timber management activities (Thomas, 1979). Table 4.23 shows the habitat for old-growth users.

TABLE 4.23 HABITAT FOR OLD GROWTH USERS (Thousand Acres)
Planned
Projected

Alternative	First Decade	Fifth Decade
Current Plan	513	541
A-1	485	489
A-2	482	484
B-1	503	516
B-2	498	512
C	512	563
D	512	564
E-1	505	504
E-2	502	496
F	509	542
F-Departure	507	515
G-Preferred	492	539
H	492	539
I	492	541
J	492	542
K	493	570

All alternatives maintain large areas of old-growth habitat. However, fewer acres would be maintained as old-growth under Alternatives A-1, A-2, B-2, E-1, and E-2.

These fewer acres would be poorly distributed, which could cause some wildlife species to be displaced. Habitat for wildlife species using the grass/forb stage would increase under these same alternatives. Under the Preferred Alternative (G) 539,426 acres for old-growth users would be retained at the end of the fifth decade. Standards have been developed to protect snags and old-growth forest (see Forest Plan).

Range

Timber harvesting creates additional transitory forage for wildlife and livestock through the removal of trees and the establishment of grasses, forbs, and other vegetation (Basile and Jensen, 1971). Alternatives A-1, A-2, E-1, and E-2 would create the highest levels of transitory range for livestock. However, transitory range is a minor component of the entire forage resource on the Forest. One adverse effect on range is harvesting natural pasture barriers. This would be mitigated through fence construction.

Soil

Timber management and associated support activities affect the soil resource (Lull, 1959; Cullen and Montagne, 1981). Harvest, site preparation activities, and road construction expose mineral soil. In addition, they contribute to soil degradation through erosion, compaction, and organic matter loss. Leaching and changes in soil temperature and moisture may occur. Exposure of mineral soil is necessary for seedling establishment (Smith, 1962) and tractor logging does expose mineral soil on a significant portion of the area. However, if topsoil is removed by the tractor operation, the productivity of the site is decreased (Froelich, 1979).

As trees are removed, evapo-transpiration is reduced and more water enters the groundwater system causing soil saturation. This is emphasized when even-aged harvest systems are used to remove entire mature forest stands. In extreme cases, this can lead to mass failure (the slipping of large areas of soil and rock) on steep slopes and clay soils (Dryness, 1967; Fredriksen, 1970; Megahan, 1972). Mass failure hazards are generally low on the Forest and potential problems will be dealt with on a case-by-case basis in pre-sale planning.

Slash disposal and site preparation methods that involve the use of heavy equipment, such as dozer piling and broadcast burning, have similar effects as tractor logging. However, more scarification, which is essential for regeneration, occurs during dozer piling than tractor logging. Other types of slash control have little effect on soil.

Firelines around broadcast burn units may be a source of sediment, if proper erosion control measures are not taken. Mineral soil must be exposed so fire cannot cross the line. The soil surface is then exposed to raindrop splash erosion, and overland flow is possible. Cross ditching of firelines to divert water into adjacent undisturbed areas is an effective erosion control measure. Overland flow could increase sediment delivery to the streams if a sufficient strip of undisturbed vegetation is not present between the burned unit and the stream (Snyder and others, 1975).

The potential for impacting soils is directly related to the level of scheduled timber harvest for each alternative. Alternative A-1 would have the highest potential for soil degradation and decreased soil productivity, while Alternatives C and K would have the least potential for adverse impacts occurring to the soil resource. Under all alternatives, Forest-Wide Standards designed to insure long-term soil productivity would be implemented. These standards provide for mitigation of possible impacts.

Water

Timber management activities affect water quality and quantity, thereby indirectly impacting the fish population in Forest streams and downstream rivers (Coleman, 1953; Megahan, 1975, 1981; Troendle and Leaf, 1981).

Water quality may be adversely impacted in watersheds where timber harvest and site preparation activities are scheduled. Water quality is primarily affected by construction such as skid trails, fire lines, log landings, and access roads (Megahan, 1981). These activities expose mineral soil, which results in soil loss through erosion and eventual introduction of soil as sediment in the streams. An increased sediment load in streams causes the intergravel areas to become plugged, reduces insect populations, and causes fish eggs to smother from lack of circulating water (Phillips, 1971; Ritchie, 1972). The most risk comes from alternatives that harvest the most timber. Tractors operating in streams can have a severe impact on the stream channel and cause excessive sedimentation for miles downstream (Bjorhn, 1974). Adherence to Forest-Wide Standards will prevent this practice.

Water quantity (water yield) is affected by timber harvest (Troendle and Leaf, 1981; Rice, 1981; Belt, 1980). The increase in groundwater and the tendency for openings to accumulate snow results in increased water yield, which generally occurs at the time of peak flow. This increased flow can benefit farmers who irrigate if there is storage capacity to capture it. Increasing the flow at peak times also can affect the stability of the streambanks resulting in some erosion. The water regime for an area harvested by an even-aged management system will generally recover to preharvest conditions about 20 years after harvest (Garn and Malmgren, 1973).

Increases in water yield adversely affects fish populations when the increase in a drainage exceeds the ability of the stream channel to handle the flow. Erosion in the upper portions of the channel forms sediment, which washes downstream and combines with sediment in the lower portions. The increased sediment in the channel changes the stream gradient. The adjustment process increases the load of sediment which may destroy spawning habitat and desirable pool to riffle ratios (Ritchie, 1972; Bjohn, 1974).

Alternatives A-1, A-2, E-1, and E-2 have the highest levels of timber harvest. Water yield from any one of these alternatives is less than a 2 percent increase. Water yield increases on any third or fourth order stream is much less than 15 percent. This change is less than the annual variation in water yield due to natural factors and would not affect stream channel morphology (USDA-Forest Service, 1974).

Riparian Areas

The effect on the Forest's total fish population depends partly on how much of the riparian timberland will be managed. There are 33,225 acres of riparian habitat on the Forest. The riparian acres identified as suitable for timber production are shown in Table 4.24.

TABLE 4.24 RIPARIAN ZONE TIMBER HARVEST

Alternative	Suitable Acres for Timber Production
Current Plan	560
A-1	12,000
A-2	0
B-1	0
B-2	0
C	0
D	0
E-1	0
E-2	0
F	1,131
F-Departure	1,131
G-Preferred	746
H	111
I	310
J	310
K	310

Under Alternative A-1, 12,000 acres in the riparian zone would be harvested on a regulated basis. This alternative would cause a significant effect in riparian areas. Under Alternative F and F (Departure), 1,131 acres in the riparian zone would be harvested on a regulated basis, under Alternative G (Preferred), 746 acres, and under Alternatives I and J, 310 acres. Under other alternatives, harvest in riparian areas would be restricted to salvaging dead and dying trees. Under all alternatives, timber management in riparian areas would maintain both fisheries and wildlife habitat.

Selection harvest, an uneven-aged management system, is used in prescriptions applied to riparian zones. This system of timber harvest selects those trees or small groups of trees that are mature or over-mature and leaves the remaining canopy undisturbed. Water quality and quantity are not measurably affected by this harvest system because the canopy is not altered significantly, soils are not unduly disturbed, and the remaining trees are able to respire the extra water (Rice and others, 1972).

Air Quality

Air quality would be affected a few days as a result of prescribed fires for slash removal and stocking control. Adverse effects on air quality are relatively minor (Komarek, 1970). The adverse effects are primarily to the visual quality and usually are short-term. Weather conditions will be carefully monitored and burning allowed only when smoke will be rapidly dispersed. Burning to achieve management objectives complies with the State Air Quality Standards (Montana Smoke Management, Memorandum of Agreement, 1978, Revised 1981). Air quality restrictions may prevent accomplishing some activity fuel treatments scheduled in some years.

Lands

The timber sale program provides many of the rights-of-way needed for public access to the Forest (see Lands, this chapter).

Protection

Timber management can provide integrated insect and disease management strategies. Timber harvesting would be used to control insects and disease, particularly in Alternatives A-1, A-2, E-1, E-2, and F (Departure). Under these alternatives, the Forest is less susceptible to mountain pine beetle

attacks because more acres are in a variety of age classes (Roe and Amman, 1970). Alternatives B-1, B-2, F, G (Preferred), I, and J provide moderate protection. Alternatives C, D, H, K, and the Current Plan provide the least protection from mountain pine beetle infestation. Table 4.1 shows the relative effects of insects and disease on the Forest by alternative.

Bark beetles and fungi can build up in slash and spread to living trees. Elimination of slash destroys the habitat for these insects and diseases and controls their spread (Furniss and Carolin, 1977). Dozer piling in a partial cut can result in mechanical damage to residual trees resulting in higher tree susceptibility to insect or disease attack. Insect and disease problems can be minimized by the establishment of a young, vigorous stand of trees.

Timber management is beneficial from the fire protection standpoint in that timber harvest reduces the level and distribution of forest fuels over time (Beaufait, 1981). Even-aged harvest systems provide the best opportunity for reduction of fire hazard. Continuous tree canopies are broken and the fuels in these openings are eliminated, thus providing fire breaks. However, increased access and accumulation of fuels associated with timber harvest increases the risk of person-caused forest fires (Smith, 1962). This increase will be mitigated under all alternatives by piling and burning the slash (FEIS, Northern Region Slash Disposal Program, 1974). Slash and other fuel reduction in shelterwood harvest is more difficult and costly than clearcuts, because the standing trees must be protected from the fuel elimination method. The slash created by thinning is a fire hazard that is difficult to manage. Broadcast or underburning is rarely possible without damage to the remaining trees. Fortunately, the relatively fine fuels are packed down by snow and decay within one or two years so the risk of losing the thinning stand to fire is reduced.

Social and Economic

Timber management on the Lewis and Clark National Forest is important to the economic base of the area. The Forest currently provides about 20 percent of the mill capacity for the Forest working circle.

For those economically dependent on harvesting and processing wood products, all alternatives, except C, D, and K would enhance lifestyle and job opportunity (see social/economic variables in Table 4.39).

Increases in the timber sale program would help meet the wood products demand and help stabilize timber dependent communities. Communities are expected to become more dependent upon National Forest timber as private land is harvested and some of it is converted to rangeland (Analysis of Management Situation, Lewis and Clark National Forest, 1981). Alternatives A-1, A-2, E-1, and E-2 provide the highest timber output and associated increases in income, employment, and county and Federal receipts.

The most dramatic population changes would occur in Alternatives A-1 and A-2. Increasing the timber sale program to 21 million board feet by 1990 would increase total primary employment by approximately 34 jobs, and produce a total population gain of 300 people.

By 2030, a 41 million board feet timber sale program would increase total primary employment by 241 jobs, secondary employment by 136 jobs, and produce a total population gain of almost 1,000 people.

In the fall of 1983, the sawmill at White Sulphur Springs was purchased and closed to reduce competition for sawlogs. This closure will shift employment opportunities to other small towns which process Forest timber. These towns include: Livingston, Judith Gap, and Townsend. Until there is a more definite pattern to processing timber from the Lewis and Clark National Forest, projecting population changes cannot be more specific.

Some employment and population changes could occur in the Monarch-Neihart area. Increases under Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 could lead to crowded conditions and clashes in lifestyles between some groups within the Monarch-Neihart communities (see social/economic variables in Table 4.39).

Timber management is an important factor contributing to the present net value of resources on the Forest. This is shown by the amount of timber harvest in the PNV Benchmark, 69.5 million board feet.

Clearcutting is the least costly method of harvesting trees, because higher volumes are removed in small areas. Shelterwood cutting is slightly more costly because a second harvest of the remaining overstory is required. Costs vary by species harvested, land slope, yarding distance, and other factors, but the removal of all trees from a site is cheaper per unit volume than removal of only a portion of the overstory. Tractor logging is the least expensive method available for getting logs to the yarding area. This can mean a greater profit to the purchaser and a greater return to the U.S. Treasury.

Costs of slash disposal and site preparation vary by method, size of unit, and slope. Hand work is more expensive than machine work, small units cost more per acre treated than larger units, and units on steep slopes are more expensive to treat than those on gentle slopes. Unit cost is independent of alternative, but the higher the timber output, the higher the total costs. Slash disposal and site preparation are necessary costs to the production of timber and, as such, have an effect on the calculation of PNV. These activities are often contracted either by the Forest Service or logger and provides jobs and income for local residents.

The economic benefits generated under different alternatives would help to increase the sense of control, self-sufficiency, and cohesion within timber dependent communities by producing a more optimistic economic outlook, which could increase community spirit (see Table 4.39 at the end of this chapter). Alternatives that increase the timber sale program would relieve the uncertainty for the timber industry in that a good supply of Forest timber would be available (Waggener, 1977).

The Forest's timber program provides additional firewood areas to woodcutters. However, firewood cutters do remove some of the material that could be used by the timber industry. Fees (currently $10.00/per four cords) are collected for firewood. Part of the fees are used to pay for maintenance of roads used by firewood cutters as well as to make additional firewood areas available.

All alternatives, except E-1, E-2, and H would harvest timber on the Blackfeet Indian Treaty lands on the Rocky Mountain Division. Increased

access into the area would provide greater opportunity to the Blackfeet for hunting, fishing, and wood gathering. However, some Blackfeet may not like to see the area changed from its natural state.

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

Under all alternatives there will be some individual timber sales which will have a negative cash flow when all costs (including transportation system development) are considered in relation to revenues from the timber harvest. These sales are referred to as "below-cost timber sales". The Forest Plan analysis shows these sales are needed to achieve both short-term and long-term benefits necessary to maximize net public benefits.

There are several reasons why these individual timber sales are below cost. (1) The construction of roads for access to undeveloped standing timber requires a large initial investment that may exceed the value of standing timber, but returns from future timber sales will amortize the costs and return a profit. (2) The geographic distribution of mature timber (e.g., the road may have to pass through immature timber with little current value to get to economically mature stands). (3) Usually there are constraints involved with protection or enhancement of nontimber resources which do not permit exploitation of all the economic potential of the existing stands in order to produce a positive cash flow on the initial entry. Examples of these constraints include design of harvest patterns to produce desired patterns of wildlife forage and cover, visual landscapes, soil and water protection, or fuels management.

Cost-efficient management for the Lewis and Clark National Forest requires that cash flow analysis must be a consideration in the economic analysis and development of project design in order to minimize negative cash flow projects (see Forest Plan, Chapter II -Timber). Forest Plan analysis data indicates "below-cost sales" cannot be eliminated entirely and still achieve projected short-term and long-term outputs.

Short-Term Use vs. Maintenance & Enhancement of Long-Term Productivity

From a timber production standpoint, even-aged harvest systems provide the best chance to improve the long-term productivity. To a large extent, insects and diseases are controlled, young and vigorously growing trees replace slow growing old trees, fire hazards are reduced, and the proper mix of tree species can be introduced.

Timber harvest by the selection system has little effect on the natural long-term productivity of the area. There is little opportunity to enhance production by introduction of other tree species or by cultural practices, such as thinning.

In most cases, logging has little effect on long-term productivity. However, it is inevitable that some logging will occur on wet soils or on isolated pockets of erosive soils. In these cases, soil compaction will occur and affect productivity. In other cases, some soil will be lost, which may affect the long-term productivity.

Reforestation can have a definite effect on productivity of the next generation of trees. Timber productivity of sites depends in part on how quickly trees are established after harvest. Adequate site preparation assists seedling survival by providing a good soil medium and reduced vegetative competition.

Slash control, if properly done is a measure to maintain and improve long-term productivity. Productivity is adversely effected if slash is not treated or if slash is treated in a poor manner. There is always a chance in machine piling and windrowing for excess soil to be displaced and erosion to occur. Fertility is lost and the next generation of trees suffer. Burning at the wrong time and allowing the fire to be too hot generally has the same effect if it occurs.

Thinning improves the productivity of wood fiber. Diseased and dead trees can be harvested during thinning operations to improve the stand. The final product following thinning is expected to be more valuable.

Irreversible and Irretrievable Commitment of Resources

Although some areas that have been harvested may never be harvested again, the road system necessary for harvest has been constructed and considerable money has been expended in revegatation. For all

practical purposes, however, areas previously harvested are irreversibly committed to timber harvest in the future. The soil lost or unduly disturbed through timber harvest constitutes an irretrievable loss to the site. The wilderness opportunities lost are also irretrievable.

The timber that could have grown by applying a more productive timber management intensity is irretrievable.

Since considerable money and effort is expended in preparing the site for a new generation of trees, it is highly probable that the next generation of trees on the site will be harvested. Soil lost or displaced by site preparation and slash disposal activities is irretrievable.

Thinning a stand almost makes an irreversible commitment to harvest the remaining trees in the stand.

Conflicts With The Objective of Other Land Management Plans, Policies, and Controls

The Blackfeet Treaty Agreement of 1896 reserved the right, "to cut and remove therefrom wood and timber for agency and school purposes, and for their personal uses for houses, fences, and all other domestic purpose", on the area referred to as the ceded lands on the Rocky Mountain Division (also see Chapter III).

If a lot of slash is burned at any one time, and heavy smoke released, the Clean Air Act quality standards may be exceeded.

Adverse Effects Which Cannot Be Avoided

Visual quality will be lowered by even-aged harvest which clearcuts lodgepole pine stands on the Forest. Some soil will be eroded and water quality will be lowered. During the logging operation, noise and dust is generated and soils are disturbed. Wildlife habitat will decrease for species preferring dense canopies or requiring cavity nesting habitat on some areas of the Forest where timber is harvested. Fish habitat will be changed by harvest occurring in riparian areas and by increased sedimentation. Some semi-primitive recreation opportunities will be developed. When this activity occurs in roadless areas, the wilderness and roadless resource is foregone.

Tractor logging leaves skid trails that are unslightly to some Forest visitors. These trails will eventually be revegetated or screened from

view. The unsightly appearance of sites that have been prepared for regeneration is unavoidable and will remain until vegetation grows and screens the effect from view. Soils are inevitably eroded or displaced. If burning is used, smoke is generated.

The most obvious adverse effect is the generation of smoke into the atmosphere by slash control. The amount of smoke generated is controlled by factors such as density and dryness of fuels and weather conditions. Other adverse effects include the scorched and blackened vistas which are short-lived and the inevitable displacement and possible erosion of soils.

The slash created by thinning will not likely be treated. This will present a fire hazard for a few years after thinning until the fire fuels decompose. Temporary losses of some hiding cover will affect big-game use of the areas. The visual resource will be adversely affected for a short time.

Energy Requirements

Since most of the timber on the Forest will be harvested by even-aged harvest systems, most of the energy required will be directly associated with these systems.

Some energy is required in slash control. If machinery is used, the energy required for a particular site can be significant. A small amount of energy is used in torches to light fires and to fuel chainsaws. Energy requirements for site preparation are very similar to those for slash control/fuels management.

Some energy will be required in transportation of the planting crews to the field and use of powered equipment during planting. This is a small portion of the total energy use on the Forest.

Most of the energy used in precommercial thinning will be used in transportation of crews to the sites and use of powered equipment for thinning. This is a small portion of the total Forest use. Energy used in commercial thinning is a part of the energy used in regular timber harvest. Energy use requirements are shown on Table 4.25.

TABLE 4.25 AVERAGE ANNUAL ENERGY CONSUMPTION RELATED TO TIMBER HARVEST DURING FIRST DECADE (Million BTU's)

Alternative	Fell and Buck	Yarding	Loading	Hauling	Re-forest ation
Current Plan	162	2,710	2,710	11,564	1,050
A-1	250	4,170	4,170	17,792	1,832
A-2	250	4,170	4,170	17,792	1,832
B-1	175	2,919	2,919	12,454	1,340
B-2	175	2,919	2,919	12,454	1,480
C	156	2,606	2,606	11,120	1,254
D	156	2,606	2,606	11,120	1,334
E-1	175	2,919	2,919	12,454	1,330
E-2	175	2,919	2,919	12,454	1,440
F	175	2,919	2,919	12,454	1,383
F-Departure	193	3,232	3,232	13,789	1,978
G-Preferred	175	2,919	2,919	12,454	1,284
H	184	3,065	3,065	13,077	1,308
I	163	2,710	2,710	11,565	1,280
J	163	2,710	2,710	11,565	1,284
K	155	2,585	2,585	11,031	1,231

MINERALS-OIL AND GAS

The Minerals Management Program administers mineral exploration and development in a manner compatible with other resource values. Oil and gas exploration and development is carried out by private companies under a Federal leasing program.

Changes Between Draft and Final EIS

The information on process steps and activities has been expanded. Tables showing the physical effects on oil and gas development and mineral potential has been added. The consequences on wildlife and fish, hydrogen sulfide, blowouts, and spill of fluids has been expanded in response to public concern.

PROCESS STEPS AND ACTIVITIES

The activities that are associated with each of the process steps are listed below.

PROCESS STEPS	ACTIVITIES
Leasing	Environmental analysis and recommendation.
Preliminary Exploration	Geologic mapping; seismic surveys, such as surface explosives; drilling; and vibroseis, gravity, and magnetic surveys.
	Off-road vehicle travel.
Exploratory Drilling	Drilling of stratigraphic tests and/or wildcat wells; roading; and construction of drill pad.
Field Development, Production, and Reclamation	Drilling wells, roading, and construction of drill pad, sweetening plants, storage tanks, pipelines, and other facilities.

Oil and gas activity is highly speculative and seldom proceeds beyond preliminary exploration. The Forest Service has compiled statistical information on the probability of various phases of oil and gas activity taking place on a given block of leases. These probabilities are based on histori-

cal patterns in the western United States. The probability of having a wildcat well drilled, is 25 percent. A small field is developed from 1 to 2 percent of the time, and a large field 0.1 percent of the time.

Leasing

The BLM (Bureau of Land Management) is responsible for mineral leasing on all Federal lands under the Mineral Leasing Act of 1920. By interagency agreement, the BLM refers all applications to lease National Forest lands to the Forest Service for review and recommendation. The Forest Service then recommends to the BLM whether or not those lands should be leased and, if so, what controls (stipulations) are needed to protect surface values and uses. These stipulations are designed to protect surface resources and at the same time provide for the development of subsurface resources.

Stipulations

The Environmental Assessment on Oil and Gas Leasing on Nonwilderness Lands, Lewis and Clark National Forest (1981) establishes the use of various stipulations that may be applied to all or portions of a lease as needed to protect surface resources. The stipulations provide the authority to modify, at any time, project proposals submitted by lessees. Exceptions may be granted if analysis of site-specific proposals determines such variances in the stipulations are appropriate. Stipulations available for use are listed below.

- -- No-Suface Occupancy.
- -- Limited Surface Use.
- -- Timing Restrictions.
- -- Activity Coordination.
- -- Further Planning.

The No-Surface Occupancy Stipulation precludes certain ground disturbing activities, such as road building, well drilling, and pipeline construction, while allowing for activities such as seismic exploration. It is generally used to avoid construction on steep slopes, geologic hazards, and in areas where the conflict with existing uses is high, such as around developed recreation sites.

The Limited Surface Use Stipulation protects areas of special value such as municipal watersheds, soils susceptible to slumping, and other areas that have sensitive features that are impractical to delineate at the time of leasing.

Site-specific analysis of project proposals would determine if there is a conflict to be avoided.

Timing Restrictions limit certain occupancy activities on important wildlife habitat and heavily used recreation areas during specified time periods.

The Activity Coordination Stipulation limits activity levels in time and space as needed to protect threatened and endangered species. This stipulation is applied to all leases in occupied threatened and endangered species habitat on the Rocky Mountain Division.

The Further Planning Stipulation allows for exploration but not production or field development until a decision on wilderness classification is made. This stipulation was applied to the Deep Creek-Reservoir North Further Planning Area.

Current Leases

Leases have been processed under the Environmental Assessment on Oil and Gas Leasing-Nonwilderness Land, Lewis and Clark National Forest (1981). Based on this analyses, 423,373 acres of the Forest have been leased. Another 60,527 acres of lease applications are pending in the Silver King-Falls Creek and Renshaw roadless areas. In addition, 60,526 acres of leases are pending in the Big Snowies MWSA area. New leases and subsequent lease reissuance will undergo additional analysis as required by NEPA tiering to the FEIS and Forest Plan.

The Bob Marshall-Scapegoat-Great Bear Wilderness complex was withdrawn from oil and gas leasing on January 1, 1984.

Leasing is only the first step of a multi-step decision process for oil and gas development. Subsequent steps occur when the lessee submits operating proposals; each proposal is subject to environmental analysis. Activities on leases that do not involve exploratory drilling or field development are regulated by the Forest Service. Exploratory drilling and field development activities are regulated by the BLM. Through a Cooperative Agreement, the BLM is responsible for enforcement of surface protection and reclamation requirements established by the Forest Service.

The issuance of a lease does not have a direct effect on other resources, but is a commitment of resources for the term of the lease (usually 10 years). The potential effects of this commitment

are controlled by attaching stipulations to the lease. Leasing grants the lessee the right to explore and develop the lease, within the terms of the lease.

New Leases

When the existing leases on the Forest expire, the issuance of new leases will be based on an analysis of current information, including oil and gas potential, as well as the Forest Plan goals and objectives which were developed in consideration of T&E and other wildlife habitat needs, water quality, soils and other resource values.

Preliminary Exploration

The next step in oil and gas development is geophysical prospecting. Which includes seismic (shaking the earth) and non-seismic methods. Activities may take place over the same area many times and continue over a number of years. An area of interest usually is identified by preliminary seismic lines run at relatively wide spacing intervals. This spacing is narrowed as the target area becomes better defined.

Non-Seismic Methods

Gravity and magnetic surveys involve taking instrument readings at fairly regular intervals or spacings. No actual surface disturbance is involved unless off-road vehicle travel is utilized to access the survey points. Some of these surveys can be done using airborne equipment which has no environmental effect. Magnetotelluric surveys are similar, but require shallow burial by hand of some cables and recording devices.

Seismic Methods

Vibroseis exploration is limited to existing roads and gentle terrain. Four to five large trucks travel in line and generate vibrations when large hydraulic pads mounted between the front and back wheels are lowered to the ground. Geophones (listening devices) placed along the line pick up vibrations and transmit them to a recording truck via cables.

Conventional seismic exploration involves the use of truck-mounted drills and vehicle-supported crews which on the Lewis and Clark National Forest are limited to existing roads. Holes are drilled to a depth of 50-200 feet. Explosives are detonated at depth and shock waves are received and transmitted via cable and geo-phones to a truck-mounted recording device.

Where access limitations, topography, or other constraints prevent the use of truck-mounted equipment, helicopter portable operations can be performed. Two portable techniques exist for collecting data.

1) Surface charge programs involve the simultaneous detonation of a series of individual 2.5 to 10 lb. explosive charges. The group of charges detonated together commonly totals 50 to 100 lbs., and is called a shot. Shotpoints are located at intervals along the seismic line. Surface charges can be placed directly on the ground, on snow, or on a variety of stakes or platforms above the ground. All necessary equipment to conduct the operation can be transported by helicopter and then conveyed by foot travel.

2) Various kinds of portable drills can be backpacked or delivered by helicopter to the area being explored. A deep sub-surface portable program would involve driling a pattern of approximately 10 holes per mile, 60 feet deep or deeper. At this depth 10-40 lbs. of explosives are detonated. Recording cables and geophones are laid out by foot travel.

With both of these portable techniques, shock waves generated are received and transmitted via geophones and cable to a recording device. Portable seismic methods generally are used on the Forest.

All applications for geophysical lands are processed under the Environmental Assessment for Geophysical Exploration - Nonwilderness Lands (1982).

Exploratory Drilling

The BLM approves and supervises oil and gas operations such as drilling and production. However, through a cooperative agreement, the Forest Service provides surface resource information to the BLM for planning and administrative purposes. The Forest Service also retains administrative authority in cases involving emergency situations endangering health, safety, and other resources. When a favorable site has been pinpointed, the company files an APD (Application to Drill) to drill a "wildcat" well. Approximately 2-4 acres are required to set up a drilling rig complete with pumps, tanks, and mud pit. Temporary access roads for transporting equipment and personnel may also be required. Often a water well is drilled. A

surface pipeline to a stream or well, or trucks, may bring water to the site for mixing with drilling mud, cleaning equipment, and cooling engines. Energy requirements for drilling are furnished by gas or diesel-driven equipment. In remote areas, well drilling may require the construction of temporary camps for workers. All APDs receive detailed environmental analysis.

FIELD DEVELOPMENT, PRODUCTION, AND RECLAMATION

If exploratory drilling results in the discovery of an oil and/or gas reservoir, field development occurs. Field development requires additional environmental analysis. Roads may be upgraded to permanent all-weather specifications and if needed, additional space is provided to place tank batteries to store oil and water on or near the drill pad.

Temporary storage tanks are used until the volume of production is known. Then liquids are trucked out at regular intervals or pipelines are installed to transport the production to refineries. If an exploratory well is productive, additional wells normally will be drilled to define the limits of the field. This would involve building additional roads, well pads, and tank batteries, and possibly installing additional pipelines and electrical powerlines.

Production plans are outlined in a Sundry Notice. Approval of a Sundry Notice by the BLM requires concurrence by the Forest Service and may require further consultation with the U.S. Fish and Wildlife Service.

Reclamation involves restoring the surface of the land to their former condition, so far as possible, including the removal of structures.

Current Situation

The U.S. Geological Survey (circular 860, 1981) has estimated from 0 to 2 billion barrels of oil with a mean of 600 million barrels of undiscovered crude oil and from 3.1 to 25 trillion cubic feet of natural gas with a mean of 9.3 trillion cubic feet of natural gas may be recoverable from the Montana portion of the Overthrust Belt. Within that context, the Northern Disturbed Belt is perceived by some as having the most promising potential for large natural gas discoveries in the entire State of Montana. However, despite the promising potential of this area, making an economic discovery with any one given hole remains far from certain.

The recent success rate along the eastern edge of the Northern Disturbed Belt testifies to this uncertainty. After more than a dozen wildcat wells over a geographically broad area, overthrust discoveries resulting in production have been confined to the Two Medicine Field and the Blackleaf Canyon Field.

Most oil and gas activity will take place on the Rocky Mountain Division (335,687 acres leased).

The Division has the greatest and most extensive potential for hydrocarbons in the form of natural gas. Examination of oil and gas fields in similar geologic settings suggests that if producing fields are established they are likely to be between 3 and 30 square miles in extent (Withdrawal Report on the Bob Marshall - Scapegoat Wildernesses, 1981).

Most of the Jefferson Division has low to moderate oil and gas potential and is not expected to be significantly affected (87,886 acres leased).

In order to convey what such fields may look like, maps showing potential arterial road corridors, surface occupancy opportunities, and hypothetical field size are displayed in the Forest Plan. In areas where surface occupancy is allowed, there are additional timing and occupancy restrictions to protect other surface resources and uses.

Table 4.26 displays how leasable energy potential would be affected by the various alternatives. The goals and objectives of each alternative result in varying stipulations. Table 4.27 summarizes the physical effects according to a "most probable" and "large discovery" scenario. Table 4.28 at the end of this section, displays the social and economic effects according to a "most probable" and "large discovery" scenario. These scenarios were developed to display the possible effects of oil and gas development based on well-spacing regulations, occupancy opportunities and accessibility. Drilling requests are handled on an individual basis, and receive site-specific environmental analysis at the time of the request. Efforts are underway to develop a computerized cumulative effect analysis process to evaluate activities on grizzly bears and their habitat. If critical areas are identified through this process, occupancy will not be permitted (see Forest Plan, Appendix L).

TABLE 4.26

LEASABLE ENERGY POTENTIAL
(Thousand Acres)

Alternative	Category 1/	Very High	High	Mod	Low
Current Plan	A	448	0	0	0
	B	328	0	0	0
	C	0	0	55	193
	D	0	0	53	766
A-1	A	448	0	55	129
	B	328	0	0	0
	C	0	0	0	0
	D	0	0	53	830
A-2	A	448	0	0	0
	B	328	0	0	0
	C	0	0	0	0
	D	0	0	108	959
B-1	A	448	0	55	129
	B	328	0	0	0
	C	0	0	14	146
	D	0	0	39	684
B-2	A	448	0	0	0
	B	328	0	0	0
	C	0	0	55	193
	D	0	0	53	766
C	A	448	0	0	0
	B	328	0	0	0
	C	0	0	80	658
	D	0	0	37	292
D	A	448	0	0	0
	B	328	0	0	0
	C	0	0	55	193
	D	0	0	53	766
E-1	A	448	0	55	129
	B	328	0	0	0
	C	0	0	0	0
	D	0	0	54	829
E-2	A	448	0	0	0
	B	328	0	0	0
	C	0	0	0	0
	D	0	0	109	958
F	A	448	0	0	0
	B	328	0	0	0
	C	0	0	55	193
	D	0	0	53	766
F-Departure	A	448	0	0	0
	B	328	0	0	0
	C	0	0	55	193
	D	0	0	53	766
G-Preferred	A	436	0	0	0
	B	340	0	0	0
	C	0	0	55	142
	D	0	0	53	817
H	A	573	0	80	395
	B	203	0	0	0
	C	0	0	4	118
	D	0	0	20	270
I	A	531	0	0	89
	B	245	0	0	0
	C	0	0	70	510
	D	0	0	37	361
J	A	413	0	0	50
	B	363	0	0	0
	C	0	0	74	549
	D	0	0	33	361
K	A	573	0	15	183
	B	203	0	0	0
	C	0	0	41	206
	D	0	0	50	572

1/ Category A - lands withdrawn or proposed for withdrawal for mineral entry.
Category B - lands where laws or executive orders require specific protection or mitigation measures apply.
Category C - lands where special mitigation measures are required by the Regional Forester.
Category D - lands where standard lease stipulations apply.

TABLE 4.27	PHYSICAL EFFECTS	
	"Most Probable" (10 wells) (2 deep drill rigs)	"Large Discovery" (21 wells) (3 deep drill rigs)
Roadless Area Developed (acres)	-3,120	-11,800
Change in Recreation Setting - Acres Semi-Primitive	-3,120	-13,080
Temporary Change in Visual Quality Objectives - Acres Partial Retention	-3,120	-13,080
Effect On Wildlife		
- Acres of Elk Winter Range Directly Affected	4	0
- Acres of Elk Calving Area Directly Affected	21	47
- Acres of Moose Winter Range Directly Affected	0	146
- Acres of Bighorn Sheep Winter Range Directly Affected	25	0
Effect on the Threatened Grizzly Bear		
- Acres of Habitat Directly Affected	90	244
- Acres of Important Spring Habitat Directly Affected	66	111
Effects on Vegetation - Acres Directly Affected	90	244
Need for Facilities		
No. of Drill Pads	10	21
Miles of Roads	8	23

Alternative A would maximize the exploration and development of potential gas and oil reserves. Coupled with high timber and grazing levels it would also have the greatest effect on the environment. Alternatives C and K would provide less opportunity for oil and gas exploration and development because semi-primitive recreation areas would be protected by no-surface occupancy stipulations. Alternatives H, I, and K would provide less opportunity because of areas recommended for wilderness classification. Alternatives G (Preferred) and J would provide additional opportunity for oil and gas exploration in the Silver King and Renshaw areas.

The Preferred Alternative (G), Alternatives B, D, F, F (Departure), and Current Plan would provide for an opportunity for oil and gas exploration and development while protecting surface value, with a full range of special and standard stipulations. Under all alternatives, areas classified as wilderness would be withdrawn from mineral entry (Category A). Alternatives A-1, B-1, and E-1 would lead to the withdrawal of mineral entry and leasing on the Middle Fork Judith and Big Snowies MWSA areas.

EFFECT ON:

Recreation

Exploratory drilling and field development would affect the quality of the recreation setting. The introduction of roads and motorized use would be particularly noticeable in semi-primitive recreation settings under all alternatives, except C and H. Under the "most probable" scenario, 3,120 acres of semi-primitive setting may be affected. Under the "large discovery" scenario 13,020 acres may be affected. Campgrounds, resorts, summer homes, ski areas, and other permitted recreation uses will be protected under all alternatives by non-occupancy stipulations.

Additional restrictions in the surrounding area maintain the visual setting. Some business operations, such as outfitters and guides, could be adversely affected by the disruption of the semi-primitive recreation setting by oil and gas activity (Environmental Assessment on Oil and Gas Leasing on Nonwilderness Lands, 1981).

Noise from helicopters transporting personnel and equipment takes place during the portable seismic activity. Also, when surface charges are detonated, the noise from the blast may be audible for several miles depending on the terrain and location of the operation (Environmental Assessment on Geophysical Exploration on Nonwilderness Lands, 1982).

User conflict on roads may take place between the general public, log hauling traffic, and oil and gas exploration traffic. Conflicts on trails between seismographic operations and recreationists may also take place.

Visual Quality

Under all alternatives where pad site and road construction is allowed, the visual quality may be temporarily lowered due to the changes in landscape color and shape (National Forest Landscape Management 2:4, (Roads), 1977). However, under the "most probable" scenario there may be a temporary change in the visual quality objectives on 3,120 acres. And, under the "large discovery" scenario 13,080 acres may be affected.

Wilderness

Classified wilderness was withdrawn from mineral entry and leasing on January 1, 1984.

All alternatives provide some opportunity for road and drill pad construction on oil and gas leased areas with surface occupancy. The extent of the road and drill pad needs will be known after applications for permits to drill are filed with the BLM. Some of these roads will, undoubtedly, be constructed in areas that are currently undeveloped and will affect the wilderness quality of the area. The Rocky Mountain Division will most likely be affected. Because these facilities are constructed with short-term use and prompt reclamation in mind, impacts on wilderness values should be minimal. Full reclamation can usually mitigate impacts to such a degree that wilderness designation will remain a viable option. If a economic discovery is made, full field development would probably have a major effect on the wilderness quality and may preclude an area from wilderness classification. Under the "most probable" scenario, 3120 acres of undeveloped land may be affected by field development. Under the "large discovery" scenario, 13,020 acres may be affected. All applications to drill will receive site-specific analysis in conformance with NEPA.

Wildlife and Fish

Human activity, blasting, and helicopter use may affect wildlife habitat use patterns. Increased human activity has the greatest potential adverse effect. Potential effects due to increased human activity include: illegal poaching; displacement of animals from their normal seasonal ranges; and confrontations with grizzly bear and gray wolf, which may lead to the killing or relocation of the animal (Environmental Assessment on Oil and Gas Leasing on Nonwilderness Lands, 1981).

The timing and location of surface occupancy for preliminary exploration and exploratory drilling activities, in relation to key habitat use patterns, would determine the significance of disturbances or displacement (Environmental Assessment on Oil and Gas Leasing on Nonwilderness Lands, 1981). The timing restrictions have been modified slightly to conform with the Interagency Wildlife Management Guidelines (see Forest Plan, Appendix I).

The sensitivity periods for wildlife are as follows:

Elk and Deer winter range	12/1 to 5/15
Elk calving areas	5/1 to 6/30
Mule Deer winter range	12/1 to 5/15
Bighorn Sheep winter range	11/1 to 5/15
Bighorn Sheep lambing areas	4/15 to 6/30
Mountain Goat winter range	10/15 to 5/15
Mountain Goat kidding areas	5/1 to 7/15
Mountain Goat breeding areas	11/1 to 12/31
Moose winter range	12/1 to 4/30
Raptor nest sites (general)	2/1 to 7/31

The inclusion of timing and occupancy restriction will minimize the disturbance to big-game.

Direct mortality from seismic activity is very unlikely. Wildlife habitat loss or degradation would be negligible during preliminary exploration (Environmental Assessment on Geophysical Exploration on Nonwilderness Lands, 1982).

Exploratory drilling and field development effects on wildlife could include possible destruction of habitat by road, drill pad, and other facility construction. The destruction of habitat could be significant if the habitat is important and limited. Under the "most probable" scenario, 4 acres of elk winter range, 21 acres of elk calving area, and 25 acres of bighorn sheep winter range may

be affected. Under the "large discovery" scenario, no acres of elk winter range, 47 arces of elk calving area, and 146 acres of moose winter range may be affected.

All alternatives have mitigating measures to protect fish habitat, limit road construction in riparian zones, and seasonally restrict in-stream entry.

T & E Species

The effect of preliminary exploration activities upon the grizzly bear and gray wolf is the increased potential for short-term displacement from key seasonal habitats (Environmental Assessment on Geophysical Exploration on Nonwilderness Lands, 1982). Under the "most probable" scenario, 90 acres of grizzly bear habitat may be affected. And, under the "large discovery" scenario, 244 acres may be affected.

The sensitive periods to human activity for grizzly bear are as follows:

Grizzly bear spring range	4/1 to 6/30
Grizzly bear denning habitat	10/15 to 4/15
Grizzly bear breeding areas	5/1 to 7/15
Grizzly bear alpine feeding site	7/1 to 9/15
Grizzly bear subalpine fir/ whitebark pine habitat types	8/1 to 11/30

The inclusion of timing and occupancy restrictions and the scheduling of activities to achieve spacing in time and location will minimize the disturbance to grizzly bear and wolves. Implementing firearm restrictions will minimize the potential for grizzly and wolf mortality to occur from human confrontations (Environmental Assessment on Oil and Gas Leasing on Nonwilderness Lands, Lewis and Clark National Forest, 1981). The timing restrictions have been modified slightly to conform with the Interagency Wildlife Management Guidelines (see Forest Plan, Appendix I).

Timber - Range

Under all alternatives use of explosives and construction of drill pads, pipelines, and roads would result in destruction of existing vegetation. The amount of vegetation disturbed by oil and gas activities would be relatively small areas and should have little effect on native plant communities. Disturbed areas would be reclaimed. Reclamation of roads and drill pads would take place naturally or by planting.

Soil and Water

Impacts of preliminary exploration on soil varies in severity and amount depending on the method of seismic survey being used and the season of the year in which the activity occurs (Environmental Assessment Geophysical Exploration, 1982). Under all alternatives, soil compaction would occur from off-road vehicle travel (Holdorf, 1981). This can be avoided by limiting off-road travel to dry periods, during the summer and fall, and by avoiding compaction-prone soils.

The use of explosives, shallow drilling, and construction of roads, drill pads, and other facilities result in soil disturbance and require reclamation measures to prevent erosion and increased stream sediment (USDA-Forest Service, 1979). Under the "most probable" scenario, 90 acres of vegetation may be directly affected. And, under the "large discovery" 244 acres may be directly affected. All alternatives have mitigating measures for riparian zones, floodplains, and wetlands because such areas have values which are especially sensitive to disturbance. Road construction effects are discussed under Facilities in this chapter. Sedimentation from the drilling pad will be controlled in the same manner as roads. In addition, drilling pads will be designed to drain into the resource pit.

Air Quality

The short-term effects from oil and gas activities on air quality are dust from trucks and other equipment and smoke and dust from each blast when explosives are used on the surface.

Some aspects of the drilling operation require special measures and procedures in order to assure that undesirable events do not take place. Among the events to be avoided are releases of hydrogen sulfide blowouts, and spills of fluids.

Hydrogen Sulfide

Hydrogen sulfide or "sour gas" is a highly toxic gas likely to be associated with any petroleum encountered by drilling in this area. Site-specific contingency plans will be completed as part of any development program. Should "sour gas" be produced, gas sweetening plants would need to be built to remove the sulfur.

Based on experience in the Alberta Overthrust Belt of 35,000 wells drilled, 83 releases of gas (regardless of type of gas) resulted. Releases of gas occurred .025 percent of the time. The chances

for a hydrogen sulfide breakout of any magnitude would be minimized by adherence to the contingency plan. Except in the event of a dead calm day with no air movement and a tremendous release of high concentration vapors, the probability of lethal dosages beyond a mile is extremely unlikely (Environmental Assessment, Hall Creek APD, 1985).

Blowouts

Blowouts result from overpressure zones encountered during drilling. The blowout material may be of a variety of different compositions, including saltwater and petroleum. Overpressure zones are not expected to be encountered in this areas, however, protection from overpressure is provided for by the drilling mud program. If the mud program alone is inadequate to counteract the overpressure while allowing for further drilling, the problem zone can be cased and cemented off from the hole. In very rare instances overpressure may result in blowouts, but these can usually be avoided by blowout prevention devices which are required to be installed between the ground surface and the floor of the drilling rig (Environmental Assessment, Hall Creek APD, 1985).

Spill of Fluids

Spills of fluids can involve drilling fluids or fluids produced from the drill hole. The material may escape from the mud pit, storage tanks, tank trucks, etc. During drilling, the greatest volume of fluids involved are generally the drilling fluids which are cycled down the well, up the well and through a system of mud tanks and into the reserve pit. The greatest chance for spillage in this system are related to reserve pit leakage. Pit leakage could, in rare instances, result in mineralized water or oily residue flowing into streams of other wetlands. Pit leakage also may result in ground water contamination. Both forms of leakage can be prevented by the pit design and inspection procedures for project. In the event of a spill the material would be cleaned up and removed (Environmental Assessment, Hall Creek APD, 1985).

Protection

Increased activity levels and the use of explosives and machinery will increase the risk of man-caused fires. These impacts will be mitigated by implementation of a fire plan, the use of no-flash or fire retardant explosives, and spark arrestors on equipment.

Facilities

The miles of road needed to support the minerals program are not identified in any alternative. The extent of road and drill pad needs will be known after applications for permits to drill are filed

with the BLM. Roads constructed for oil and gas activities will usually be closed to public use and obliterated when no longer needed. Roads that may be constructed for oil and gas exploration and development are not included in the Forest's road construction program, such roads are proposed as part of a specific application to drill and receives site-specific analysis through additional NEPA procedures. Existing practices, standards, guidelines, and other requirements will be followed. Under the "most probable" scenario, 10 drill pads and 8 miles of road may be needed. The effects of road construction is discussed later in the chapter under Facilities.

Social and Economic

Some of the greatest social and economic effects from Forest resource activities could come from oil and gas development. Most of these activities are expected in the Rocky Mountain Division in three general areas: the Badger-Two Medicine area, the Blackleaf-Teton area, and in the Silver King/Falls Creek area. Activities in the Badger-Two Medicine area would most likely affect the Blackfeet Reservation, communities of East Glacier and, to a lesser extent, Browning. Activities in the Blackleaf area would affect Choteau, and activities in the Silver King/Falls Creek area would affect Augusta.

The social and economic effects are summarized in Table 4.28 according to a "most probable" and "large discovery" scenario (also see Table 4.39 at the end of this chapter). Oil and gas activities outside of the Forest are now having social-economic effects within local communities. What happens on the Forest is highly dependent upon discoveries on private lands.

TABLE 4.28 SOCIAL AND ECONOMIC EFFECTS

"Most Probable" (10 wells) (2 deep drill rigs)	Development	Production
Number of Employees	50	5
Number of Employees Who Are Local Hire (Including Commuter)	10	3
Duration	2-4 years	20 years
Annual Payrolls (1978 rate)	$1,000,000	$85,000
Number of Secondary Jobs Generated	56	5
Annual Payroll From Secondary Jobs - (1978 rate)	$610,000	$55,000
Total In-migration (Excludes Local & Commuters)	110	12
Housing Units Needed	50	4
New Students:		
Elementary	15	2
Secondary	6	1

"Large Discovery" (21 wells) (3 deep drill rigs)	Development	Production	Gas Processing Facility Construction-Maintenance	
No. of Employees	75	7	50	20
No. of Local Hire	8	4	25	10
Duration	2-4 years	30 years	8 months	30 years
Annual Payroll	$1,500,000	$120,000	$675,000	$290,000
Secondary Jobs	84	5	56*	20*
Secondary Jobs Payroll	$ 900,000	$ 53,000	$560,000*	$219,000*
Total In-migration	165	18	85	28
Housing Units Needed	75	6	37	12
New Students:				
Elementary	22	3	12	5
Secondary	9	2	5	2

*Large temporary construction crews may not generate this much secondary employment-income.
Source of Calculations: Social & Economic Assessment of O&G Activities - Information & Guidelines. Lambert Wenner, M&G, USFS, R-1, 1981.

SOCIAL AND ECONOMIC

The effects shown in Table 4.28 are dependent upon the settlement patterns of oil and gas workers. Most workers live in motels and eat in restaurants in adjacent communities. Workers tend to have long shifts and one out of every three weeks usually return to their permanent homes outside of the area. Because of this there has been little demand for additional housing or new students in the local school systems. Housing needs and educational impacts could increase during the production and maintenance phases of oil and gas development under the large discovery scenario.

Many of the oil and gas support services along the Rocky Mountain Front presently come from Choteau, Shelby, and Conrad and will most likely continue in the future. Choteau has a high proportion of elderly residents and a slow-paced lifestyle. Oil and gas activities now impact these aspects of community life. Oil and gas royalties and employment/income have been an economic benefit to the community and county tax base. The agricultural and tourism sectors have been down in recent years and oil and gas activities has taken up the slack. Under the most-probable scenario, Choteau could absorb social impacts but it is likely that they would cause some community friction. Although housing and educational impacts probably would not be as large as these shown in Table 4.28, there could be a need for some additional housing and school staff. There are differences in opinion among residents about the community's growth and the social costs they are willing to pay for more oil and gas oil activities.

Under a large discovery scenario there would be a significant growth rate in Choteau, but again how much social strain this would cause is a function of residents' attitudes toward growth. To some, any negative social impacts would be compensated by positive economic gains. To others, any positive economic impacts would be cancelled by a disruption of lifestyles.

With a large discovery in the southern portion of the Rocky Mountain Front, Augusta could handle additional people, but such an increase would produce some negative effects on residents' lifestyles, e.g. a loss of the quiet and predictable pace that Augusta is known for or a loss of familiarity and trusting between neighbors. It could also strain the community's ability to provide adequate services such as water, sewage, telephones, and electrical utilities.

In the East Glacier area, two clear factions exist regarding oil and gas: the business community and younger residents. Many of the latter group have recently moved there to escape more industrial sections of the nation and are very concerned about the protection of the Rocky Mountain Front from oil and gas and other development.

During the past several years there has been a high level of oil and gas activity on private lands which has helped the area's economy, especially during the non-tourist season. Housing has been in short supply for several years and new mobile homes have been a community issue between groups. However, 1985 brought forth a substained reduction in oil and gas activities. Utility hookups for any new housing, especially sewage and telephone, would be a problem in the large discovery scenario. In this scenario, community cohesion would be disrupted and it is possible that many of the younger residents would move out.

The Blackfeet Indian population would also be affected by oil and gas activity in this area. The Badger-Two Medicine area lies within the Indian Treaty lands. Increased access into the area would provide greater opportunity for hunting, fishing, and wood gathering. However, some Blackfeet may not like to see the area changed from its natural state.

Oil and gas leasing and exploration along Glacier National Park's boundaries may have a direct influence on Glacier's wildlife, air and water quality, and visual resources. (Glacier National Park--Natural Resources Management Plan and Environmental Assessment, 1983.) The Forest Service will work closely with Glacier Park to minimize any possible impacts if oil and gas activities occur near the Park's boundary.

Short-Term Use vs. Maintenance & Enhancement of Long-Term Productivity

Although geophysical prospecting activities themselves generally do not cause significant surface disturbance, the disruption to wildlife, and other Forest users can be significant. Any exploration drilling and field development of oil and gas resource is likely to have a long-term effect on the productivity of the specific sites. Drilling requires many support activities and once started, continues seven days a week for twenty-four hours a day. Drilling equipment could remain on-site six

months to a year or more for a deep well. Vehicle traffic to and from the site is high during construction, operation, and reclamation. Pits, drill sites, waste deposits, and roads are not easily rehabilitated. When a well is brought into production, the area needed for production can be expected to be committed to that use for possibly 30 years or more. The area of production, drill pad, and related access roads or processing plants will be out of vegetative production for a long time. There also will be short-term losses of vegetation from installation of pipelines and other facilities. Leasing, in itself, will not affect productivity.

The discovery and production of oil and gas will lessen the threat of a national energy shortage occurring again soon, decrease dependence on foreign imports from politically unstable or warring countries and reduce the balance of payments deficit.

Irreversible and Irretrievable Commitment of Resources

Leasing is not an irreversible commitment of a resource, since the lease may never be subjected to exploration. However, once exploration and development occurs, the effects are irreversible. Although such sites may be rehabilitated, the vegetation lost while the development was in place is irretrievable as is the oil, gas, and other associated fluids removed from the area.

Adverse Effects Which Cannot Be Avoided

If exploration drilling or production occurs, soil will be disturbed, erosion will occur, and water quality will be lowered. Roads may be located in areas that do not fit the emphasis of the Forest Plan. Some visual resource will be lost. Naturalness and roadlessness will be lost when these activities occur in roadless areas, thus reducing the opportunity for wilderness classifications. To the extent practical, the adverse effects would be mitigated by the lease and operating plan stipulations.

Whenever a well is drilled, there exists the possibility of pentrating a formation that contains abnormally high pressures, or hydrogen sulfide gas. Pressures could cause the well to "blow out" even though precautions are taken. If this happens, salt water and gases are blown from the well, killing surrounding vegetation. Hydrogen sulfide emissions from a well would be life threatening to people, wildlife, and livestock in the immediate vicinity. There is a small likelihood of encountering large quantities of salt water on the Rocky Mountain Division.

Conflicts With The Objective of Other Land Management Plans, Policies, and Controls

No conflicts have been identified.

Energy Requirements

Energy is consumed during geophysical prospecting activities. Drilling a well and the associated earth moving for roads and well pads require the consumption of large amounts of fuels. The production of oil and gas resources, while producing a great amount of energy fuels, does consume a large amount of energy. This energy is all consumed in the private sector. Some energy will be used in monitoring the mineral activities, but this energy use will amount to a small percentage of the total energy used on the Forest.

MINERALS-METALLICS

Private companies explore and develop the metallic or hard rock minerals on National Forest land. Mineral prospecting and extracting activities are listed below.

Changes Between Draft and Final EIS

Information on the current situation and the locatable mineral potential has been added.

PROCESS STEPS AND ACTIVITIES

PROCESS STEPS	ACTIVITIES
Prospecting	Geologic mapping, geochemical-geophysical surveys, digging holes, drilling holes, or using explosives, exploratory shafts, and adits.
Extraction	Drilling, sinking shafts, adits, dredging, and open pit development. Disposal of mine tailings and settling ponds. Building facilities. Roading.
Reclamation	Landscaping, seeding, planting, securing, or closing mine openings.

Current Situation

Development work has taken place on patented mining claims in the Barker-Hughsville area. Lead, zinc, silver, and trace amounts of gold may be produced at some time in the future. Exploration for molybdenum has been carried out on Upper Carpenter Creek for several years. Amateur gold panning will probably increase.

Table 4.29 displays how locatable mineral potential would be affected by the various alternatives. Metallic mineral exploration and development will occur under all alternatives. Under all alternatives, operating plans would include provisions to minimize adverse impacts on surface resources and mitigation requirements.

TABLE 4.29

LOCATABLE MINERAL POTENTIAL

(Thousand Acres)

Alternative	Category 1/	Very High	High	Mod	Low
Current Plan	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
A-1	A	0	0	7	630
	B	0	0	0	328
	C	0	0	30	160
	D	5	30	128	525
A-2	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
B-1	A	0	0	7	630
	B	0	0	0	328
	C	0	0	30	160
	D	5	30	128	525
B-2	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
C	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
D	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
E-1	A	0	0	7	630
	B	0	0	0	328
	C	0	0	30	160
	D	5	30	128	525
E-2	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
F	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
F-Departure	A	0	0	0	448
	B	0	0	0	328
	C	0	0	32	165
	D	5	30	130	705
G-Preferred	A	0	0	0	436
	B	0	0	0	440
	C	0	0	32	165
	D	5	30	130	705
H	A	0	0	122	927
	B	0	0	0	203
	C	0	0	6	142
	D	5	30	32	376
I	A	0	0	0	619
	B	0	0	0	245
	C	0	0	32	151
	D	5	30	130	631
J	A	0	0	0	463
	B	0	0	0	362
	C	0	0	32	158
	D	5	30	130	663
K	A	0	0	0	772
	B	0	0	0	203
	C	0	0	32	150
	D	5	30	130	521

1/ Category A - lands withdrawn or proposed for withdrawal for mineral entry.
Category B - lands where laws or executive orders require specific protection or mitigation measures apply.
Category C - lands where special mitigation measures are required by the Regional Forester.
Category D - lands where standard lease stipulations apply.

Under all alternatives, areas classified as wilderness would be withdrawn from mineral entry (Category A). Alternative A-1, B-1, and E-1 would lead to the withdrawal of mineral entry on the Middle Fork Judith and Big Snowies MWSA areas. Alternatives H, I, and K would provide less opportunity for mineral development because of areas recommended for wilderness classification on the Jefferson Division where the mineral potential on some areas is moderate. All alternatives recommend some wilderness classification in the Rocky Mountain Division where the hard rock mineral potential is low.

Under all alternatives, developed recreation sites would be protected from adverse effects through surface use regulations.

EFFECTS ON:

Recreation

Primitive and semi-primitive recreation settings could be affected. Road or trail construction to access valid claims could cross these settings. Primitive and semi-primitive areas may be disturbed during exploration and development.

Visual Quality

Mining operations within the proximity of arterial and collector roads would affect the visual quality. Any mines or open slopes or open pit mining would also change the visual quality.

Wilderness

Classified wilderness was withdrawn from mineral entry and leasing on January 1, 1984.

Wildlife and Fish

Small mammal and fish habitat could be eliminated by placer and dredging operations. Fish habitat improvements and revegetation can help mitigate adverse impacts in some situations (Wildlife Users Guide for Mining and Reclamation, 1982).

Soil and Water

The mineral potential is low for placer and dredging operations. A large operation (about two or three acres) would affect local soil and water conditions.

Soil disturbance would require special measures to prevent increasing sedimentation in the local streams. Underground mining would create mine tailing disposal sites of one to 13 acres. Mitigating these disposal sites includes site

location away from water and landscaping. Access roads and trails would be constructed according to Forest Management practices, standards, and guidelines. Road construction effects are discussed under Facilities in this chapter.

Social and Economic

Alternatives A-2, B-2, and E-2 could enhance the lifestyle and job opportunity of miners. Alternatives A-1, B-1, E-1, H, and K could limit this lifestyle and opportunity, because of increased wilderness (see Table 4.39 at the end of this chapter).

Discovering a large mineral deposit would impact local communities. These impacts are discussed under the social and economic effects of oil and gas.

Short-Term Use vs. Maintenance and Enhancement of Long-Term Productivity

Activities associated with exploration and development of mineral resources will have the numerous effects on other resource values and uses. The major effects will come from road construction and development of extraction sites such as shafts, adits, and open pits. Although environmental effects can be minimized through existing regulations, the long-term effect will be an overall decline in the quality of the environment.

Irreversible and Irretrievable Commitment of Resources

The removal of mineral resources is an irreversible and irretrievable commitment of the resource. A reduction in the Forest's unroaded lands (including those acres in inventoried roadless areas) may result from exploration and development. There will be some irreversible and irretrievable commitment of cultural and historical resources.

Adverse Effects Which Cannot Be Avoided

The following adverse effects (described above) cannot be avoided: surface disturbance and overall decline in the quality of the environment; disruptions to wildlife and its habitat; conflicts with other Forest users; and social and economic impacts on local communities.

Conflicts With The Objective of Other Land Management Plans, Policies, and Controls

Energy development on National Forest lands may conflict with the management of adjacent BLM Outstanding Natural Areas on the Rocky Mountain Division and with wildlife migration, air and water quality, and visual impacts in Glacier National Park.

Energy Requirements

Energy would be used to explore for, develop, and produce mineral resources. It also would be used by the Forest Service to monitor the surface disturbance produced by these activities. Severely restricted access for exploration would greatly increase energy consumption for this activity.

SOIL AND WATER

Soil and Water Management Programs protect, conserve, and enhance the soil and water resources. Activities include monitoring water quality, quantity, and the effects of activities on soil, and protecting the resources, where needed, with structural improvements, such as water bar, debris dam, and seeding, and other mitigating actions. Specific projects include channel stabilization, debris removal, and clean up and restoration of overused sites.

Changes Between Draft and Final EIS

Information on resource consequences has been added in response to public concern.

Water Yield

Average annual water yield from National Forest land is approxmately 1,700,000 acre feet, of which 1,698,000 acre feet meets minimum standards, according to state standards for "Best Management Practices." About 37,000 tons of sediment are produced naturally.

Table 4.30 displays the increase in acre feet of water and tons of sediment produced as a result of management activities by alternative. These values are for comparison purposes and are not absolute measurements.

TABLE 4.30 SOIL AND WATER

Planned
Projected

Alternative	Increases in Water Quantity (Thousand Acre Feet/Year)		Increases In Sediment Yield Over The Natural Level (Thousand Tons/Year)	
	First Decade	Fifth Decade	First Decade	Fifth Decade
Current Plan	0	0	+3.8	+2.9
A-1	0	+20	+4.6	+7.8
A-2	0	+20	+4.9	+6.5
B-1	0	+10	+4.1	+4.3
B-2	0	+10	+4.7	+4.3
C	0	0	+3.9	+2.9
D	0	0	+3.8	+3.4
E-1	0	+20	+4.1	+5.5
E-2	0	+20	+4.2	+5.4
F	0	+10	+4.1	+4.3
F-Departure	0	+10	+4.7	+5.2
G-Preferred	0	+10	+3.8	+3.4
H	0	+10	+3.9	+3.7
I	0	+10	+3.8	+3.3
J	0	+10	+3.8	+3.3
K	0	0	+3.8	+2.7

Alternatives C, D, G, H, I, J, and K would have sediment yields approximately equal to existing sediment yields for at least the first five decades. Alternatives A-1, A-2, B-1, B-2, E-1, E-2, F, and F(Departure) would have sediment yields slightly higher than current sediments yields for at least the first five decades. Alternatives B-1, B-2, F, F (Departure), G (Preferred), H, I, and J would produce an additional 10,000 acre feet of water yearly (a 6 percent increase). Alternatives A-1, A-2, E-1, and E-2 would produce 20,000 acre feet of water yearly (a 12 percent increase).

All alternatives require erosion control methods upon project completion to protect watershed values. All alternatives include planned completion of backlog restoration projects by 1995 (373 acres). Soil and water management would make little or no change in the physical and biological environment. Restoration of watersheds disturbed in the past would increase water quality in some areas, although the need for restoration is very small (Watershed Improvement Needs Inventory, 1982).

All alternatives also protect the O'Brien Creek and Willow Creek municipal watersheds to assure a continuous supply of high quality water for domestic use. Little timber harvest and no grazing is allowed in these two watersheds. The economic loss is small because the timber harvesting and grazing potential in these areas is low.

All alternatives protect soil productivity. Alternatives that increase the acres harvested would increase the water yield, until vegetation is reestablished.

EFFECT ON:

Resources

Water quality is changed primarily by timber harvest, mineral development, and road construction (Megahan, 1972, 1975; Rice, 1981). Watershed protection relative to timber harvest, minerals, and road construction is discussed under timber, minerals and facilities, respectively. Forest Standards minimize these impacts (see Forest Plan). Increased water yield can damage stream channels and increase channel sediment, which harms fisheries and water quality (Megahan, 1981; Troendle and Leaf, 1981).

	Site-specific water quantity increases are evaluated in a timber sale environmental analysis. This analysis provides the protection necessary to ensure channel stability and acceptable quantity increases.
	Each watershed improvement project is quite important to the few acres or short stretch of stream involved. Effects include decreased soil erosion, preventing overflow of stream channels by removing debris, stopping pollution by cleanup of old waste dumps, and similar actions. Results will include improvement of fish habitat in and below the projects and improvement of water quality downstream from the projects. Each project will be subjected to analysis prior to initiation and the effects will be identified. The number of projects over the past several years averages one or two per year and is expected to remain the same in the forseeable future, regardless of alternative.
Short-Term Use vs. Maintenance and Enhancement of Long-Term Productivity	Specific watershed projects each year will have an effect on a few acres. Streambank stabilization and debris removal will protect water quality and fish habitat not only on the site but also downstream from the site. Areas that are restored will eventually return to original vegetative condition and productivity.
Irreversible and Irretrievable Commitment of Resources	Commitment only exists if the projects are completed.
Adverse Effects Which Cannot Be Avoided	When working in streams to stabilize channels and remove debris, the stream bottom and banks will be disturbed and water quality will deteriorate for a short period of time.
Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	No conflicts have been identified.
Energy Requirements	Energy will be required to complete the projects and to monitor watershed conditions on the Forest, but this will be a small portion of the total Forest energy use.

LANDS

The Lands Program manages land ownership adjustments, land uses, utility corridors, rights-of-way, land status, and land line location.

Changes Between Draft and Final EIS

Information on landownership adjustments, land uses, utility corridors, rights-of-way, and land line location has been added.

Land Ownership Adjustments

Land exchange proposals are generally initiated by private owners. Therefore, exchange proposals for the future are unknown. Historically, about five proposals are received each year, but less than one exchange is acted on each year. About 8 percent of the land within the proclaimed Forest boundary is privately owned. Each proposal will be analyzed to help guide subsequent action.

Land Uses

The Forest administers nearly 400 special-use permits, which allow the occupancy of National Forest System lands for various uses.

Effects associated with special-use roads are the same as discussed under Facilities in this chapter. Effects associated with the pastures are the same as discussed under Range. Other than impacts caused by the associated roads the consequences of the power and phone lines are slight. In some areas visual quality may be affected.

Though the effects of the special uses may be drastic for the specific sites, these uses are limited to a small acreage of the Forest. Each request for a new permit will be subjected to environmental anaylsis, which considers management objectives, prior to approval. Permit approval depends on satisfactory mitigation of effects.

Utility Corridors

An analysis has been made to define the kinds of land that should be avoided in permitting or constructing linear rights-of-way, utility lines, oil and gas pipelines, and communication lines. The analysis is based on information contained in the Pacific Northwest Long Range East-West Energy Corridor Study, Phase 1 (draft), Part A-Rocky Mountains, Part B-Cascade Mountains, Bonneville Power Administration, December, 1977. This analysis inventories existing facilities and potential corridor locations. This study identified one potential corridor location crossing the Forest (RN2), this route parallels U.S. Highway 2. This area is identified as an avoidance area because of

the high scenic values. Guidance for the analysis is contained in a Region 1 letter to the Forests on Corridor Planning Guidance, 1990 Special Plans and Studies dated October 7, 1982. Avoidance areas are defined as areas where establishment and use conflict with land use/land management objectives. Exclusion areas are define as areas where such facilities are not allowed. Window are short, narrow passageways through constrained areas that are the most feasible potential locations for linear facilities.

Four existing utility corridors are on the Forest. These corridors contain electrical lines ranging from 100 to 500 KV, a gas pipeline, railroad, and highways.

Only when these corridors are occupied does the impact occur. Prior to construction of a utility line or oil and gas pipeline, an appropriate analysis would be required to establish the final location of the facility and its supporting road. At that time, the effects of the facilities would be displayed.

Rights-of-Way

Road and trail rights-of-way are acquired by the Forest from non-Federal owners; rights-of-way are generally in connection with the Forest's timber harvest program. However, they also provide public access to the Forest. Some rights-of-way are acquired specifically for this purpose. Rights-of-way, on which roads are constructed, affect about 10 to 15 acres of private land each year. Table 4.31 shows the number of needed right-of-way acres, by alternative.

TABLE 4.31 LANDS REQUIRED FOR RIGHTS-OF WAY

Alternative	Miles of Rights-of-Way
Current Plan	99
A-1	199
A-2	199
B-1	183
B-2	183
C	168
D	148
E-1	169
E-2	169
F	70
F-Departure	76
G-Preferred	70
H	70
I	70
J	70
K	64

The amount of right-of-way varies by the location of the timber sale program and is related to the amount of road construction and timber harvest. Alternative A-1, A-2, B-1, B-2, E-1, and E-2 have larger rights-of-way programs. Land acquisition, special uses, and utility corridors, would be the same under all alternatives (see Forest Plan).

Construction and maintenance of roads is the only environmental effect associated with rights-of-way. This is discussed under Roads.

Land Line Location

Currently about 24 miles of National Forest land boundaries are located each year. Boundary location involves considerable manpower and time but has few environmental effects. Some vegetation may be trimmed or completely removed to establish line of sight for the survey instrument, but the amount is inconsequential.

Boundary location establishes, with some finality, the property lines of Forest and other ownership. It enables owners to avoid trespass (timber harvest or otherwise) on land they do not own. Location of boundaries has no affect on PNV, nor does it affect the economy of the area.

Wildlife	Some of the scheduled land acquisition is on elk habitat. This would increase the Forest's carrying capacity for elk. However, more rights-of-way would increase Forest access. This could adversely affect big-game and T&E animals, by increasing hunting and other recreation.
Timber	If acquired lands contain substantial amounts of woodland, the Forest would be able to manage the timber, and possibly increase the sale program.
Range	Acquired road right-of-way could interrupt livestock distribution and movement.
Social and Economic	Citizens whose land is involved in right-of-way may find increased access brings increased littering, vandalism, and theft. The county's tax base would decrease if private land became public. However, as more land is accessed, more land is available for timber harvest, oil and gas development, recreation, and firewood gathering (see Table 4.39 at the end of this chapter). Special use fees are collected from permittees. However, the fees collected do not offset the administrative costs of the program.
Short-Term Use vs. Maintenance and Enhancement of Long-Term Productivity	Lands that enter private ownership following exchange will be managed by the new owner as they desire. Lands obtained by the Forest Service through exchange will be managed to maintain or enhance productivity. Vegetation is destroyed on sites that are occupied or altered because of special uses. These effects will remain as long as the facilities remain. Through the rights-of-way program access is gained to land that could not otherwise be developed. Productivity can be maintained or improved.
Irreversible and Irretrievable Commitment of Resources	Lands entering private ownership through exchange are committed to whatever the new owner desires. Lands obtained by the Forest Service will be managed according to the land management plan in effect at the time. Rights-of-way can be relinquished although this is unlikely to happen in the foreseeable future. The resulting roads imply an irreversible use and the vegetation removed by the construction and maintenance constitute an irretrievable loss of a resource.

	The structures, roads, and other special uses will likely be maintained into the foreseeable future. The vegetation lost constitutes an irretrievable loss of resource.
Adverse Effects Which Cannot Be Avoided	The soil will be disturbed by construction of structures, powerlines, and roads, but it will tend to stablize over time. Special use facilities may not blend well into the natural landscape. Some rights-of-way are difficult to acquire and may be obtained by condemnation. Such actions are seldom pleasant for both parties. Adverse effects of the resulting road construction are discussed under Roads.
Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	No conflicts have been identified.
Energy Requirements	Little or no energy is used in land exchange and rights-of-way except for the appraisal and negotiation process. Some energy will be used by the Forest in monitoring special uses, but this will be a minor portion of total Forest use. Some energy use is expended in travel when surveying land lines, but this is small compared to total Forest energy use.

FACILITIES-ROADS AND TRAILS

The Facilities Program builds and maintains roads and trails. The program's activities include transportation planning, road engineering, and road and trail maintenance and management.

Changes Between Draft and Final EIS

Information on road and trail management and cultural resources, wildlife, soil and water, and social and economic consequences has been added in response to public concerns.

Road and Trail Program

Road construction affects almost all Forest resources and uses (Forest Transporation Study Report; FSH 7709.11, Chapter 10). The primary effects are the displacement of soil, increased vehicle and public access, reduced big-game security, decreased visual resources, and the change of primitive recreation opportunities in previously roadless areas to those allowing vehicles. Roads provide Forest access so that resource management objectives can be met. Once a road is built it can be used for many purposes.

Table 4.32 shows the miles of arterial and collector roads, local roads and trail construction/reconstruction by alternative.

TABLE 4.32 ROAD AND TRAIL CONSTRUCTION/ RECONSTRUCTION (Miles/Year)

Planned Projected

	Arterial & Collector Roads		Local Roads		Trails	
Alternative	First Decade	Fifth Decade	First Decade	Fifth Decade	First Decade	Fifth Decade
Current Plan	4.5	5.1	12.5	10.7	0	0
A-1	4.2	17.9	21.0	33.8	1.5	1.5
A-2	5.2	19.1	22.9	36.1	1.5	1.5
B-1	4.5	5.4	16.2	29.3	.8	.8
B-2	4.5	10.1	17.6	24.8	0	0
C	4.5	3.8	15.3	12.0	2.0	2.0
D	4.5	3.8	10.7	10.2	2.0	2.0
E-1	4.5	6.5	16.0	33.2	2.0	2.0
E-2	4.5	17.4	17.1	34.8	1.8	1.8
F	4.5	4.8	14.1	14.6	2.0	2.0
F-Departure	5.2	10.1	19.8	17.7	2.0	2.0
G-Preferred	3.6	2.0	13.0	14.8	10.0	10.0
H	3.6	2.0	13.0	21.7	5.0	5.0
I	3.6	2.5	12.9	13.2	5.0	5.0
J	3.6	2.0	12.9	12.9	5.0	5.0
K	1.7	1.4	12.4	7.8	2.0	2.0

Alternatives A-1 and A-2 have the most disturbance from roads because of the larger timber programs. The Current Plan and Alternatives C, D, H, and K provide for the least disturbance from roads.

There are now approximately 1,400 miles of road on the Forest. About 600 miles of additional local and collector roads are needed to complete the transportation system for Alternative K, which recommends large area for wilderness designation and has a small timber program. At the other end of the spectrum, approximately 2,100 miles of additional road are needed to complete the transportation system in Alternative A, which would access most areas outside current wilderness. In all the alternatives, most of the roads would be built by the end of the fifth decade.

Roads and trails are an intergal part of the Forest Transportation System. They support much of the Forest recreation and provide access for firewood cutting. The management of roads, trails, and off-road areas is called "travel planning". Generally, new arterial and collector roads are open to public use.

Roads and trails are managed to provide public access, public safety, resource protection while minimizing environmental and user conflicts. Off-road vehicles are managed to protect resources, promote public safety, and to minimize user conflicts. The objective of road and trail management is to allow maximum public use of the systems consistent with protection of other resources.

All of the Rocky Mountain Division (both wilderness and nonwilderness lands) have special restrictions governing ORV and other vehicle use. Wilderness is closed to all motorized use. Nonwilderness lands are either closed or restricted to the type of vehicle or season of use. In addition, 34 miles of road and 176 miles of trail are also closed or restricted.

About 20 percent of the Jefferson Division (222,400 acres) have special restrictions governing ORV and other vehicle use. In addition, 176 miles of road and 469 miles of trail are also closed or restricted to the type of vehicle or season of use. Most new local roads will be closed or restricted.

EFFECTS ON:

Recreation

Alternatives with the most road construction would cause the greatest change in recreation settings. Table 4.4 shows the change in settings. (See Recreation this chapter.) As areas are roaded, opportunities for primitive and semi-primitive recreation would be lost. At the same time, people seeking motorized access and recreation would have new opportunities. This is a long-term effect, even though it could be mitigated through road closures and restoration of roadbeds. Road management can, to a certain extent, also mitigate potential conflicts between recreationists by providing both non-motorized and motorized opportunities.

Additional roads in roaded natural settings increase road density, but do not change the overall environment. Even in a roaded natural setting, a road management program restricting use on some roads at certain times of the year, provide for the fullest range of recreation opportunities.

Visual Quality

Road construction can create visual impacts by changing the color, texture, and lines of the landscape (USDA Forest Service, National Forest Landscape Management, Road 2(4), 1977). Roads introduce lines into the landscape that can be visible for many miles, depending on topography and vegetation. Cut and fill areas are often highly visible. Where the visual resource is important, the effect can be reduced by leaving vegetative screens and seeding. Table 4.5 shows the change for each visual quality objective by alternative.

Where retention or partial retention of the natural landscape is desired, a road can be blended with the surroundings by seeding slopes, leaving screen vegetation, treating slopes with a darkening agent, and keeping cuts and fills to a minimum. Trail construction would have little effect on the visual quality. All visual management objectives have mitigating measures to reduce the effects of roading (see USDA Forest Service, National Forest Landscape Management, 1977).

Cultural Resources

Road construction can result in adverse or positive effects to cultural resources. Roads provide more access which allows more people to enjoy the Forest environment, but also increases the chance for vandalism.

Wilderness

Road construction alters the basic character of the land. Undeveloped lands that are roaded lose their wilderness characteristics and wildland values. Opportunity for wilderness classification is foregone. Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 develop the most roadless land. (See Table 4.7, Wilderness this chapter.) Appendix C evaluates the effects of development on each roadless area by alternative. Road construction is prohibited in classified wilderness.

Wildlife

Roads alter the natural wildlife habitat. Roads often cut across game trails, changing patterns of animal movement (Thomas and Toweill, 1982). Road clearings remove forage and thermal and hiding cover. Road location and design can mitigate some of these impacts. Where possible, roads follow the contour to minimize cuts and fills, and clearing widths are minimized.

The opportunities roads present for increased human use to the Forest poses the greatest adverse impacts on wildlife (Flynn, 1982; Lyon, 1975-79; Thomas and Toweill, 1982). Road management under all alternatives is a critical element to wildlife, particularly for T&E and big-game species. Elk and grizzly bear are the major species affected. Human activity and encounters can disturb elk calving areas, summer and winter ranges, migration routes, forage areas, dens, and security areas. Potential effects include displacement of animals from their historically used range, poaching and reduced security from hunters, and human to animal confrontations which lead to the killing or relocation of the animal. Particularly during hunting season, open roads can adversely affect wildlife populations. Trails share some of the same effects, but to a much lesser degree. Road management can mitigate some potential conflict. All alternatives recommend restricting use on new roads in critical wildlife habitat.

Controlling use of many Forest roads in important wildlife habitat is often essential during the period that these habitats are used by animals. Control of vehicle access into important wildlife habitat accomplishes several things: 1) it maintains the capacity of the land to produce healthy, productive, and stable wildlife populations; 2) it provides year-round security habitat needed by

wildlife; 3) it reduces the vulnerability of big-game animals to both illegal and legal harvest; and 4) it helps maintain over the long-term the type of hunting season that both resident and nonresident hunters expect to find on the Lewis and Clark National Forest.

Parts of the habitat for some small animals will be destroyed by road construction, but other habitat may be created for those animals who exist along the edge of the Forest.

Road construction through riparian areas adversely affects stream channels and fisheries (Woolridge, 1979; Bjorhn, 1974; Ritchie, 1972; Thornson, 1976). Road construction in riparian zones would be built to conform to Forest-Wide Standards, and any stream crossing will be designed to avoid blockage of fish movement.

Timber

In mountainous terrain, between four and eight acres of land occupy the road prism for every mile of road built. No trees will grow on the road surface, but will grow on some portions of the cut and fill slopes. Productivity may be reduced along the sides of roads that cross steep slopes.

Soil and Water

Road construction significantly impacts soil and water (Megahan, 1972-75; Megahan and Kidd, 1972). Construction activities can cause soil erosion, increased sedimentation, and reduced water quality. These effects vary by the amount of road constructed, the type of soils, and steepness of the land. Trail construction has similar affects, but to a much lesser degree. Proper road location, design and construction, and installation of drainage structures would help mitigate impacts of road construction. Under all alternatives, road construction techniques will reduce the amount of stream sedimentation. Grass seed, mulch, fertilizer, sod, and netting could be used on cut and fill slopes to prevent erosion. Because most erosion occurs during the first year following construction, it is essential that revegetation be accomplished as soon as possible. Sediment can be reduced by 25 percent by revegetation. In addition, roads will be constructed during the dry season. Use of appropriate stream crossing facilities will protect the riparian environment. Road maintenance disturbs the mineral soil, also resulting in soil loss (Packer and Christensen,

1964; Megahan and Kidd, 1972). Maintenance practices will be planned to minimize soil disturbing activities. Traffic restrictions will be imposed during the wet seasons to protect road surfaces. Firewood cutters increase the need for road maintenance and road restrictions.

Roads in riparian areas can cause significant stream sediment. This adversely affects fisheries by smothering eggs, fry, and food organisms. Fry and fingerlings lose hiding cover and are more vulnerable to predators. Riparian area roads will be built to conform to Forest-Wide Standards, to minimize adverse effects on riparian environments and water quality. Forest-wide mitigation measures, in the form of standards, apply to all road construction activities to reduce stream sediment. All alternatives will meet State water quality standards because best management practices will be identified during project level planning and used during implementation. Monitoring will help assure that the cumulative effects of projects within drainages will comply with State water quality standards.

Protection

Because roading increases access, more timber stands which are susceptible to insects and disease may be harvested. Alternatives A-1, A-2, B-1, B-2, E-1, and E-2 provide the greatest opportunity to harvest stands whereas Alternatives C, D, and K have the least.

Except where road closures occur, an increase in roads would raise the risk of person-caused fires; however, roads also improve initial attack capabilities and provide fuel breaks. Burning of right-of-way slash from road construction and dust from road use would have localized adverse effects on air quality. These effects generally would be short-term and not significant. On busy roads dust could be reduced by spraying water or oil on the road. This would occur under all alternatives.

Social and Economic

Roads provide opportunities for management and extraction of commodity resources such as timber and oil and gas.

Generally local roads will be constructed by the timber purchasers, through road credits. The first road entry into some areas for timber management, where timber values are too low to carry the cost, will have to be financed by capital investment money (see Table 2.9).

Under all alternatives, new roads may be constructed or existing roads reconstructed by oil and gas companies to develop the oil and gas resource. These would be in addition to the miles of road calculated in this Forest Planning process. If a substantial find occurs, powerlines and/or pipelines may be constructed along the road corridors.

Roading can reduce the security habitat for elk, which reduces elk hunting opportunity. Roading can also have an adverse effect upon the symbolic meaning people may attach to the roadless natural setting of a particular area. For instance, some Blackfeet Indians may not want to see the Indian Treaty lands changed by road access, timber harvesting, or oil and gas development. On the other hand, roading can provide greater opportunities for people to enjoy the area or derive economic benefit. Road management such as road closure and careful placement of roads can provide mitigation of the adverse effects.

Road construction is a major cost in all alternatives. The cost reduces returns to the U.S. Treasury and payments to local governments. Most of the roads will be built by local contractors, which is a significant direct and indirect benefit to the local economy.

Short-Term Use vs. Maintenance and Enhancement of Long-Term Productivity

Construction of roads has a long-term effect on productivity. Even though efforts may be made to rehabilitate a road, the road bed and the cut and fill slopes will not produce vegetation at the rate prior to construction. However, roads facilitate timber harvest, which can have a positive effect on future timber productivity of the area. Through the road and trail management program, some recreational opportunities are lost, but wildlife habitat is enhanced.

Irreversible and Irretrievable Commitment of Resources

Road construction is an irreversible commitment of resources, since roads are essentially permanent features of the landscape. If roads are not built, timber cannot be economically harvested and an irretrievable loss of a resource occurs. If roads are built in roadless areas, wilderness and roadless potential and primitive recreation are irretrievable losses. Any soil loss due to erosion is an irreversible effect. Opportunities for recreation and firewood cutting may be lost when roads and trails are closed.

Adverse Effects Which Cannot Be Avoided

Regardless of steps taken to prevent it, some sediment from roads will reach streams and adversely effect water quality and fish habitat. The vegetative potential of the road surface is lowered or lost. Some public are against road closures.

Conflicts With The Objective of Other Land Management Plans, Policies, and Controls

The Blackfeet Treaty Agreement of 1896 reserved, "the right to go upon any portion of the lands hereby conveyed so long as the same shall remain public lands of the United States", on the area referred to as the ceded lands on the Rocky Mountain Division (also see Chapter III). No other conflicts have been identified.

Energy Requirements

Road construction and maintenance requires the largest amount of energy use of any activity on the Forest. Energy requirements are displayed in Table 4.33.

TABLE 4.33 AVERAGE ANNUAL ENERGY REQUIRED FOR ROAD CONSTRUCTION AND MAINTENANCE (First Decade)

Alternative/Benchmark	Million BTUs
Current Plan	18,742
A-1	28,886
A-2	30,981
B-1	22,822
B-2	24,366
C	21,830
D	16,758
E-1	22,622
E-2	23,815
F	20,507
F-Departure	27,564
G-Preferred	18,192
H	18,302
I	18,192
J	18,192
K	15,546

PROTECTION

Fire Management

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

Changes Between Draft and Final EIS

Information on suppression and prescribed fire has been added.

Suppression

The purpose of fire suppression is to minimize damage to valuable resources by suppressing wildfires at minimum cost. Suppression strategies appropriate to meet management direction range from direct control, minimizing acreage burned, to more indirect methods of containment and confinement. In the past, fire suppression strategy has been to aggressively control and extinguish all wildfires. From 1970 to 1979, fires have burned an average of 492 acres per year with a suppression cost of about $208,000 per year. The extent of fire suppression activities depends on fire starts.

Prescribed Fire

A prescribed fire is a fire burning under specified conditions to accomplish specific planned objectives. Prescribed fires occur with either planned or unplanned ignition to achieve some management purpose. Prescribed fires are used to improve forage conditions for big-game and livestock, for slash disposal following timber harvest to perpetuate natural ecosystems such as in wilderness, and to reduce natural or unnatural fuel accumulations. The consequences of prescribed fire are discussed further under Wildlife, Range, Timber and Facilities. Prescribed fires with unplanned ignition are allowed to burn under observation or prescription in accordance with a predetermined set of conditions, for the same purposes. Because prescribed fires reduce fuel accumulations, they reduce the potential for large intense wildfires.

Table 4.34 shows the average annual planned prescribed burning for each alternative.

TABLE 4.34 PRESCRIBED FIRE

Alternative	Natural Fuel (Acres/Year)	Activity Fuel (Acres/Year)	Total Planned (Acres/Year)
Current Plan	1573	1393	2966
A-1	3148	3143	6291
A-2	3268	3294	6562
B-1	1905	2367	4272
B-2	1967	2382	4349
C	1979	1497	3476
D	2481	1300	3781
E-1	2765	2503	5268
E-2	2623	2672	5295
F	2279	2230	4509
F-Departure	2293	2033	4326
G-Preferred	2037	1750	3787
H	942	1753	2694
I	2028	1703	3731
J	2026	1701	3727
K	1672	1135	2807

Prescribed fire is currently included in the management direction for the Bob Marshall and Scapegoat Wildernesses. This does not change by alternative. All alternatives provide for an increase in prescribed burning. Those alternatives that provide for the larger amount of prescribed fire have the greatest potential for reducing acreage burned by wildfire. Wildfire burned acreage should also be reduced in decadent lodgepole pine by scheduling timber harvests in high hazard fuels with subsequent debris disposal. Alternative F (Departure) places the most emphasis on the removal of high risk lodgepole pine stands from mountain pine beetle attack. This alternative would also, for that reason, provide the greatest opportunity for the reduction of large wildfires in the lodgepole pine type. The Level I Fire Management Analysis Report describes in detail the environmental consequences of prescribed fire and wildfire on the ecosystem of the Lewis and Clark National Forest. Other documents that describe environmental consequences in more detail are:

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

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

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

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

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

Short-Term Use vs. Maintenance and Enhancement of Long-Term Productivity

Effective fire suppression will protect the current crop of trees. And, if practiced on any one site for too long, fire suppression will induce a change in vegetative composition and density that may affect productivity. Fire protection may also create situations where dry fuels are so abundant that fires are difficult to combat and burn so hot that productivity is reduced. Overall, fire suppression generally maintains productivity and enhances the possibility that trees can be harvested at the appropriate time.

Prescribed fire can have a long-term effect on the vegetation and animals occupying the area. Overstory (trees or shrubs) may be entirely replaced or provided for by removing existing decadent vegetation. The native productivity is not normally destroyed and, in fact, may be temporarily enhanced.

Irreversible and Irretrievable Commitment of Resources	Natural changes in vegetation, desirable or undesirable, due to fire suppression constitutes an irretrievable loss of that resource as long as the suppression continues. A proposal to prescribe burn is not irreversible. Analyses based on established criteria are made for unplanned ignitions to decide whether a particular fire should or should not be suppressed. If the fire is allowed to burn, the consumed material is irretrievable, but conditions caused by the fire may stimulate regrowth.
Adverse Effects Which Cannot Be Avoided	Loss of soil due to construction of firelines will occur despite care in location and preventive measures. Build-up of fuels will continue in areas excluded from fire and may result in a hot humus and litter consuming fire that increases potential for sediment, because the soil is exposed to wind and water. The aftermath of the fire will remain visible for a short time. Smoke will be generated into the atmosphere. Habitat for some animals and birds will be temporarily destroyed.
Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	None identified. However, coordination may be required with other agencies to avoid cumulative impacts on air quality.
Energy Requirements	Energy required in the fire suppression program is dependent on the number and kind of fires. In years with numerous large fires, this use can be a substantial portion of the total energy expended by the Forest. A minor amount of energy will be consumed in monitoring the prescribed fire. This use is small when compared to the energy needed to suppress such fires.
Insect and Disease	No insect or disease pests are currently affecting management on the Forest, but those having the potential within the planning period are: - Mountain pine beetle in lodgepole and ponderosa pine - Western spruce budworm in Douglas fir, subalpine fir and spruce - Douglas fir bark beetle in Douglas fir - Dwarf mistletoe in lodgepole pine - Spruce bark beetle in spruce - Root diseases of conifers, especially Douglas fir

Changes Between Draft and Final EIS

Information on the effects of insects and disease has been added in response to public concern.

An index of relative effects is shown in Table 4.35.

TABLE 4.35 INSECT AND DISEASE RELATIVE EFFECTS

Alternative	Relative Effects 1/
Current Plan	.15
A-1	.26
A-2	.30
B-1	.24
B-2	.27
C	.14
D	.17
E-1	.24
E-2	.29
F	.20
F-Departure	.24
G-Preferred	.19
H	.15
I	.19
J	.18
K	.14

1/ Numbers are based on total suitable acres for timber harvest. The larger the number the more responsive the alternative is to reduce losses to insect and disease.

While all alternatives deal with insect and disease through timber harvest, alternatives which harvest the most timber (A-1, A-2, B-1, B-2, E-1, E-2, and F-Departure) have the greatest relative effects.

The most effective means to conduct an integrated pest management program on the Forest is through vegetative manipulation by timber harvest and encouraging some species diversity in all stands.

The alternative that harvests the most timber would reduce the timber loss from insect and disease. The effects are discussed under Timber.

Scheduling harvest of high risk stands before infestation occurs is another control measure planned by the Forest. To the extent feasible, timber harvest in the first two decades will be scheduled in lodgepole pine stands classified as high risk for the mountain pine beetle.

Approved pesticides may also be used on high value areas, such as campgrounds, or when all other methods have failed and other resource values can be protected. Environmental effects associated with chemical control vary by the type and amount of chemical used and the method of application. In most cases, the major impact would be on non-target insects that would have a secondary effect on the food resource of birds and animals in the area. Streams, though avoided to the extent possible, could be affected by pesticide drift and affect the food supply for fish. Despite greatest care, there is always the danger of spills and misapplication.

There are no plans for use of pesticides on the Forest under any alternative. Should the occasion arise, such proposals would be subjected to environmental analysis prior to initiation.

Insect and disease control has the potential for affecting the local economy. If large infestations occur and controls are not applied, timber available to the local markets can be reduced over the long-term. Efforts to combat infestations do not contribute much to the local economy since these efforts are a part of the regular workload (timber harvest) or, in case of pesticide use, are short-term. Insect and disease has little affect on calculating PNV, since it is assumed that catastrophic infestations will not occur or, if they do, will be brought under control.

Lack of effective insect and disease control can cause large areas of dead vegetation, which increases the potential for large intense fires. Such fires could adversely affect productivity, wildlife habitat, and visual quality, and increase the potential for soil erosion.

Short-Term Use vs. Maintenance and Enhancement of Long-Term Productivity

The application of appropriate silvicultural methods to control insects and disease increases the long-term productivity of the Forest from the standpoint of recoverable resources.

Irreversible and Irretrievable Commitment of Resources	The major control measures proposed by the Forest are the timing and type of silvicultural treatments. Harvesting in a certain way implies that the new generation of trees will also be harvested. Though this is not irreversible, it is a long time commitment. Tree killed by insects represent an irretrievable loss of timber.
Adverse Effects Which Cannot Be Avoided	Silvicultural attempts to control insects may result in harvesting and may also result in larger than 40 acre cutting units.
Conflicts With The Objective of Other Land Management Plans, Policies, and Controls	No conflicts have been identified.
Energy Requirements	Energy required to combat insects and disease by silvicultural means is equal to that of the regular timber management workload. Should a proposal be made to use pesticides, additional energy would be required.

SOCIAL/ECONOMIC CONSEQUENCES

SOCIAL/ECONOMIC CONSEQUENCES

Area of Influence

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

Much of the future growth remains tied to the natural resources. The area has made repeated attempts to attract new business in, but with only limited success. Although the area offers many opportunities, the weather and geographic isolation will continue to make businesses look elsewhere. Tightening credit, escalating fertilizer prices, and high transportation costs continue to make the economic situation bleak. Any alternatives which have negative economic impacts would be especially bad because of these economic conditions; likewise, any positive impacts would have beneficial effects.

Changes Between Draft and Final EIS

None.

Population

Little negative population impact is projected in any of the alternatives because of the low existing population densities and the small rate of projected population growth. Table 4.36 shows the projected changes in population by alternative.

TABLE 4.36 CHANGE IN POPULATION

Planned Projected

Alternative	People First Decade	People Fifth Decade
Current Plan	0	0
A-1	427	1352
A-2	427	1352
B-1	55	584
B-2	53	524
C	2	- 15
D	3	40
E-1	37	970
E-2	33	927
F	50	600
F-Departure	55	655
G-Preferred	18	344
H	178	281
I	35	136
J	262	532
K	32	- 72

In Alternatives A-1, A-2, B-1, B-2, E-1, E-2, F, F (Departure), G (Preferred), H, I, and J which result in increased populations, newcomers' lifestyle values would not differ from those values that presently exist. Alternatives A-1, A-2, E-1, and E-2 would have population increases which may effect small communities that would process the increased wood products from these alternatives.

Increased population would most likely increase pressures for land subdivisions. Most rural communities within the area-of-influence want community growth, and therefore, the costs of new ownership patterns would be more acceptable. An increased density of homes on private lands in the Little Belts would conflict with many resident's sense of appropriate private land use (see Table 4.39 at the end of this chapter).

Employment

Table 4.37 shows the projected change in employment by alternative.

TABLE 4.37 CHANGES IN EMPLOYMENT

Planned / Projected

Alternative	First Decade (Person Years)	Fifth Decade (Person Years)
Current Plan	0	0
A-1	186	588
A-2	186	588
B-1	24	254
B-2	23	228
C	1	- 6
D	1	17
E-1	16	422
E-2	13	403
F	23	260
F-Departure	34	196
G-Preferred	7	129
H	80	123
I	20	199
J	115	232
K	14	- 15

Alternatives A-1, A-2, E-1, and E-2 provide the greatest increase in job opportunity. This increase would take place in the wood products industry. Alternatives B-1, B-2, F, F (Departure), G (Preferred), H, I, and J provide moderate increases in job opportunity, also in the wood processing industry.

Alternatives C, D, and K would not significantly affect job opportunity. Timber operations within the area are dependent upon demands. Continued high interest rates, more multi-family dwellings, wood substitutes, and lower operation costs in other regions all point to rough times for local timber concerns. Logging and processing will most likely continue in the area but will involve temporary layoffs.

Job opportunities in the ranching sector are limited because farms and ranches can support only a given number of people. Maturing youth will continue to look outside of the area for jobs. This would lead to an older population structure (see Table 4.39 at the end of this chapter).

SOCIAL/ECONOMIC CONSEQUENCES

Income

Like population and job opportunity, income is related to the level of the timber harvest. Table 4.38 shows the projected change in income by alternative.

TABLE 4.38 CHANGE IN INCOME

Planned / Projected

Alternative	First Decade (Thousand Dollars/Year)	Fifth Decade (Thousand Dollars/Year)
Current Plan	0	0
A-1	1438	6968
A-2	1438	6968
B-1	297	3297
B-2	266	3226
C	9	- 42
D	110	43
E-1	266	5648
E-2	287	5495
F	260	3305
F-Departure	472	2672
G-Preferred	94	1764
H	1332	2761
I	307	3924
J	1733	4394
K	124	-1483

All alternatives, except C and K would increase the income to the area; however, only Alternatives A-1, A-2, E-1, and E-2 would be significant. These alternatives would provide a beneficial effect to local area income (see Table 4.39 at the end of this chapter).

Impacts on Women and Minorities

All alternatives, with the possible exception of C and K, will have favorable employment impacts on minorities and women. Timber harvesting on the Rocky Mountain District may present job opportunities for Blackfeet Indians, who now have a high rate of unemployment. Increases of primary and secondary employment will provide greater job opportunities for women. The small drop in jobs and income in Alternatives C and K will not have any negative impacts on women and minorities.

TABLE 4.39

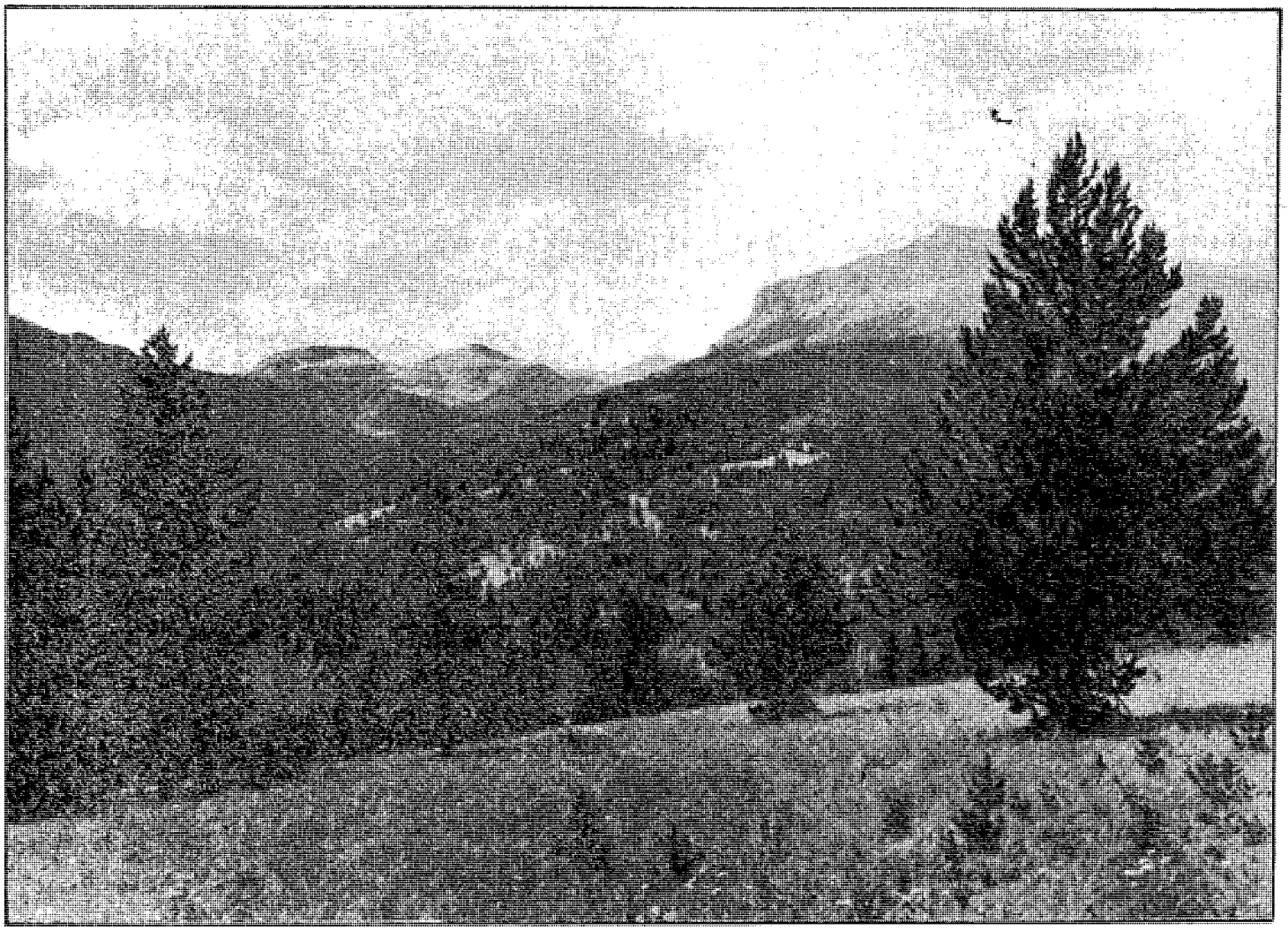
SOCIAL TRAITS

How the communities social traits are affected by the alternatives is shown in Table 4.39. These effects are discussed throughout the chapter.

	UNITS	CURRENT PLAN	ALT A-1	ALT A-2	ALT B-1	ALT B-2	ALT C	ALT D	ALT E-1	ALT E-2
SOCIAL/ECONOMIC										
-Change in Sense of Control/Self-Sufficiency	Index 1/									
Less Development		0	-2	-3	-2	-3	0	0	-2	-3
Nonwilderness		0	-2	+2	-2	+2	0	0	-2	+2
Wilderness		0	+2	-2	+2	-2	0	0	+2	-2
Timber		0	+2	+3	+1	+1	0	0	+1	•1
-Change in Lifestyle and Job Dependence	Index									
Grazing		0	+2	+2	+1	+1	-1	+3	+1	+1
Mining		0	+1	+1	0	0	-1	0	0	•1
Oil and Gas		+2	+2	+3	+2	+2	0	+2	+2	•3
Timber		0	+3	+3	+1	+1	0	0	+2	•2
-Change in Population and Crowding	Index									
White Sulphur Springs		0	+2	+2	+1	+1	0	0	+2	+2
Monarch-Neihart		0	-2	-2	-1	-1	0	0	-1	-1
-Change in Community Cohesion	Index									
White Sulphur Springs		0	+2	+2	+1	+1	0	0	+1	•1
Monarch-Neihart		0	-2	-2	-1	-1	0	0	-2	-2
Rural Residents		0	-3	-3	-2	-2	0	0	-3	-3
-Change in Landownership Patterns	Index									
White Sulphur Springs		0	-1	-1	0	0	0	0	-1	-1
Monarch-Neihart		0	-2	-2	0	0	0	0	-1	-1

	UNITS	ALT F	ALT F (Depart)	ALT G (Prefer)	ALT H	ALT I	ALT J	ALT K
SOCIAL/ECONOMIC								
-Change in Sense of Control/Self-Sufficiency	Index 1/							
Less Development		-1	-2	-1	+3	-1	-2	+2
Nonwilderness		0	0	0	-3	-1	0	-2
Wilderness		0	0	0	+3	+1	-3	+2
Timber		+1	+2	+1	+1	+1	+2	-1
-Change in Lifestyle and Job Dependence	Index							
Grazing		+1	+1	0	-3	+1	+1	-1
Mining		0	0	0	-2	0	+1	-1
Oil and Gas		+2	+2	+2	-2	-1	+2	-1
Timber		+1	+2	+1	1	+1	+2	-1
-Change in Population and Crowding	Index							
White Sulphur Springs		+1	+1	+1	0	+1	+1	0
Monarch-Neihart		-1	-1	-1	0	-1	-1	0
-Change in Community Cohesion	Index							
White Sulphur Springs		+1	+1	+1	+1	+1	1	0
Monarch-Neihart		+1	-1	+1	+1	-1	-1	0
Rural Residents		+1	-2	+1	+1	-2	-2	0
-Change in Landownership Patterns	Index							
White Sulphur Springs		0	0	0	0	0	0	0
Monarch-Neihart		0	0	0	0	0	0	0

1/ Factors which reduce the expression of these social variables are shown with a (-) and factors which heighten the expression of these variables are shown with a (+). The numbers 1, 2, and 3 are a relative ranking: 1 is the least and 3 is the most. Factors which are neutral are represented by a (0).



The View Looking Up Bear Creek.

FEIS
Chapter V
List of Preparers

Overview

This chapter lists those people who were primarily responsible for preparing this FEIS. Over the past seven years almost every permanent employee of the Lewis and Clark National Forest has been involved in some phase of Forest Planning.

LIST OF PREPARERS

MANAGEMENT TEAM

Responsibility	Member
Forest Supervisor (1978-1979)	Ken Weyers B.S. Range Management; 24 years experience in forestry, range management, and administration.
Forest Supervisor (1980-Present)	J. Dale Gorman B.S. Forest Management; 21 years experience in forestry and administration.
District Ranger Rocky Mountain RD	Lloyd Swanger B.S. Forestry; 28 years experience in forestry and administration.
District Ranger Judith RD	Larry Froberg B.S. Forest Management; 21 years experience in forestry, forest management, and administration.
District Ranger Mussellshell RD	Carl Fager M.F. Forest Management; 18 years experience in forestry, forest resource management, and administration.
District Ranger Kings Hill RD (1978-1984)	Ron Primozic B.S. Forestry; 25 years experience in forestry, fire management, resource management, and administration.
District Ranger Kings Hill RD (1985-Present)	Vic Standa B.S. Forestry; 25 years experience in forest management and administration.
Range/Wildlife/ Recreation Staff (1978-1981)	Darrol Harrison B.S. Forestry; 23 years experience in forestry, range, and administration.
Range/Wildlife/ Recreation Staff (1981-1984)	Mike Goggin B.S. Forest Management; 24 years experience in forestry and administration.
Range/Wildlife/ Recreation Staff (1985-Present)	Jerry Reese B.S. Forestry, M.S. Range Management; 15 years experience in forestry and administration.
Timber/Fire/State and Private Forestry Staff (1978-1984)	Paul Hightree B.S. Forestry; 26 years experience in forestry, fire, and administration.
Land Management Planning/ Information Staff Planning Team Leader (1978-1981)	John Skinner B.S. Forestry; 20 years experience in forestry, land management planning, and administration.

LIST OF PREPARERS

MANAGEMENT TEAM

Responsibility	Member Qualifications and Experience
Land Management Planning Staff Planning Team Leader (1981-Present)	Dick Smith B.S. Wildlife Technology; 22 years experience in forestry, long range and special planning, and administration.
Soil/Water/Air/Minerals Staff Soil Inventory (Resource Core Group) (1978-1981)	Herb Holdorf B.S. Agronomy; 21 years experience in soil science and administration.
Soil/Water/Air/Minerals Staff (1981-Present) Minerals Inventory, Analysis, and Planning (Resource Core Group)	Chuck Frey B.A. Geology; 11 years experience in geology, minerals, resource assessment, and mineral law.
Administrative Officer	Paul Threlkeld B.S. Accounting; 20 years experience in budget and finance and administration.
Forest Engineer	Bill Duryee B.A. Education, B.S. Civil Engineering; 24 years experience in civil engineering and administration.

RESOURCE CORE GROUP

Responsibility	Member Qualifications and Experience
Silviculture Timber Inventory and Analysis (1978-1981)	Dwight Chambers B.S. Forestry (Range Option); 15 years experience in silviculture and forestry.
Timber Inventory, Analysis, and Planning	Jim Eakland B.S. Forestry; 29 years experience in forestry, timber planning, and valuation.
Wildlife Inventory, Analysis, and Planning	Roger Evans B.S. Wildlife Management; 25 years experience in range, wildlife management, and administration.

LIST OF PREPARERS

RESOURCE CORE GROUP

Responsibility	Member Qualifications and Experience
Hydrology, Inventory, Analysis, and Planning (1981-Present)	Val Hancock A.S. Forestry, B.S. Watershed Management, M.S. Range Management; 17 years experience in hydrology.
Silviculture Timber Analysis	Cecil Kassing B.S. Forestry, CEFES Certified; 27 years experience in forestry and silviculture.
Minerals Analysis and Planning (1980-1983)	Nancy Kidd B.S. Geology; 11 years experience in geology and minerals.
Recreation Inventory, Analysis, and Planning Land Exchange, Right-of-Way (1982-1985)	Ed Kinsman B.S. Forestry; 31 years experience in forestry, administration, and recreation.
Range Inventory, Analysis and Planning	Wayne Phillips B.S. Forestry (Range Management); 13 years experience in range management, and forestry.
Transportation Inventory, Analysis, and Planning	Dale Schaeffer B.S. Construction Engineering Technology; 13 years experience in civil engineering and transportation planning.
Minerals Inventory, Analysis, and Planning (1978-1981)	Mark Weber B.S. Geology, M.S. - Geology; Ph. D. Geology; 22 years experience in geology, minerals, and administration.
Fire and Fire Planning (1978-1984)	Everett M. Stiger B.S. Forest Management; 27 years experience in forest management and administration. The last 5 years have been exclusively in fuels management, fire ecology, and fire management planning.

SYSTEM CORE GROUP

Responsibility	Member Qualifications and Experience
Social Inventory and Analysis	Palmer Bowen B.A. General Psychology, Graduate work in Industrial Psychology and Management; 6 years experience in Industrial Psychology and Social Science analysis.

LIST OF PREPARERS

SYSTEMS CORE GROUP

Responsibility	Member Qualifications and Experience
Operations Research Analysis (FORPLAN) Economics Alternative Analysis (1978-1984)	Dave Cawrse B.S. Forest Resource Management, M.S. Forest Economics; 5 years experience in operations research, forest economics, and management planning.
(1983-Present)	Dennis Heffner B.S. Forestry; Masters Degree in Public Administration; 12 years experience in forestry, range management, and planning.
(1984-Present)	Paul Barrett B.S. Forest Resource Management, M.S. Forest Economics; 2 years experience in operations research, forest economics, and planning.
Public Involvement Coordination Analysis of the Management Situation Alternative Analysis Writing/Editing Documentation (1978-1983)	Michael Cushman B.A. English; 9 years experience in planning, public information, writing, editing, and administrative management.
Public Involvement Coordination (1983-Present)	Jane Weber B.S. Forestry; 9 years experience in forestry and public involvement.
Work Plan Analysis of the Management Situation (1978-1980)	Steve Solem B.S. Forestry, B.A. Geography; 10 years experience in forestry, planning, and administration.
Inventory and Data Base Alternative Analysis Analysis of the Management Situation (1978-1982)	Bill Timko B.S. Forestry, M.F.S Forest Science; 8 years experience in forestry and planning.
Analysis of the Management Situation (1980-1982)	Sharon Dolezal B.S. Forestry, M.S. Forestry; 5 years experience in forestry and planning.

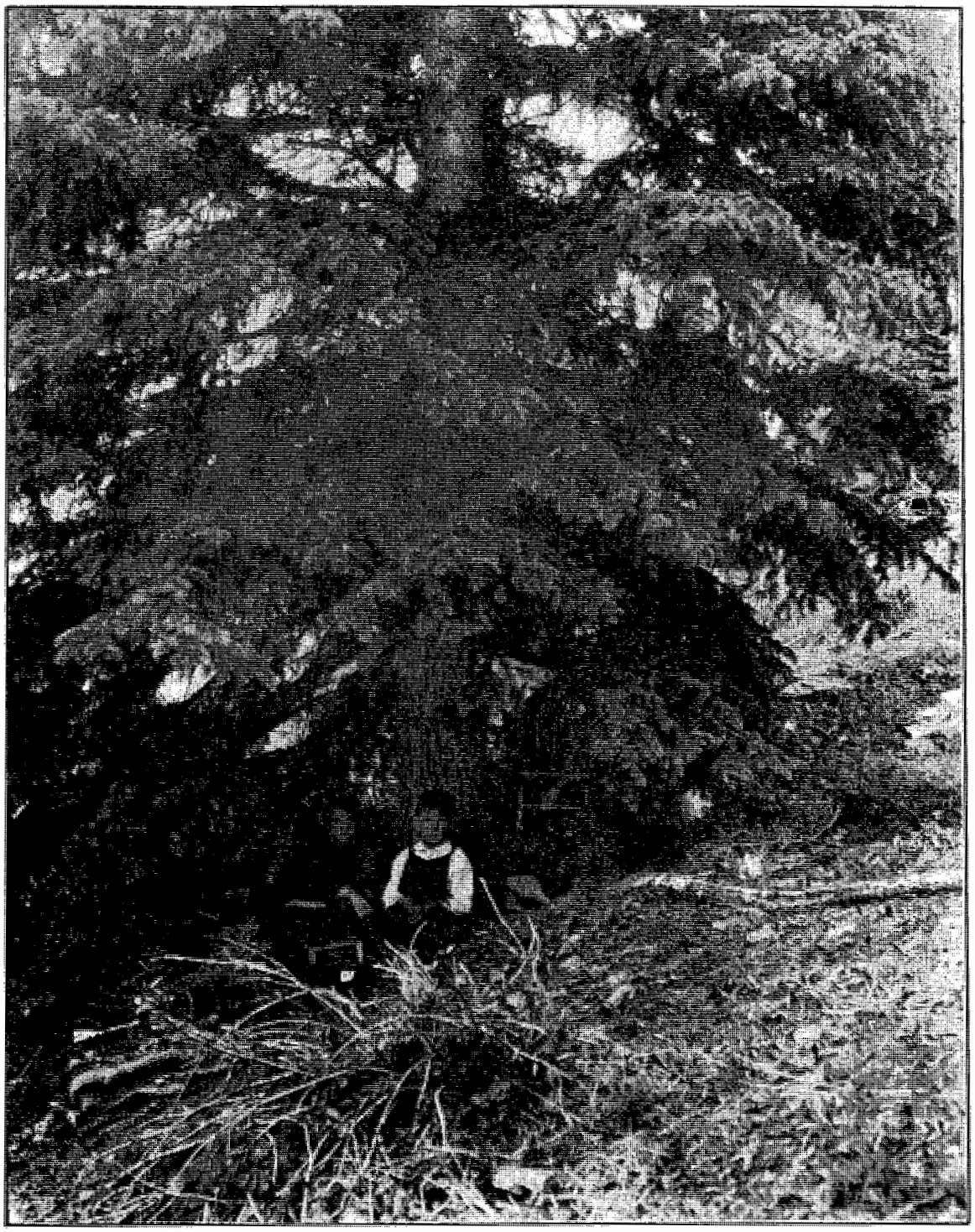
OTHER SPECIALISTS

Cartography and Mapping	Karen Cramer Undergraduate work in graphics and art; 8 years experience in cartography.

LIST OF PREPARERS

Land Exchange and Rights-of-Way (1981-1982)	George Racely B.A. Forestry, B.S. Range Management; 33 years experience in forestry, range, lands, and real estate appraisal.
Technical Writing (1983-1985)	Suzanne Birchard B.S. Forestry; 7 years experience in forestry.
Record of Decision	Larry Timchak B.S. Forestry Management; 7 years experience in forest management.

LIST OF PREPARERS



Childrens Playhouse under a Tree by the Sutton Mine 1924.

FEIS

Chapter VI
Consultation With Others

Overview

This is a new chapter that highlights public involvement and summarizes public comment and Forest Service response to the comments on the (1) DEIS and Proposed Forest Plan (page 6-4) and (2) the DEIS-Supplement and Revised Forest Plan (page 6-102). Also listed are the agencies, organizations, elected officials, and others to whom copies of the FEIS were sent.

Appendix E lists the commentators to the DEIS and displays letters from Federal, State, and Local Agencies and Forest Service responses.

Appendix F lists the commentators to the DEIS-Supplement and displays letters from Federal, State, and Local Agencies and Forest Service responses.

Appendix G contains the additional public comments and Forest Service responses. Because of its bulk, the Appendix was not distributed with the FEIS. However, it is available for review at the Lewis and Clark Forest Supervisor's Office.

All comments were considered equally.

PLANNING COORDINATION

PLANNING COORDINATION

From the outset of the planning process, Federal, State, and local agencies and interested publics have been informed of the Forest Plan's development. Letters, planning updates, news releases, and public meetings were all used to distribute information. In addition, many groups have corresponded and had meetings with the Forest when necessary. These actions are documented in the Forest planning records.

Over 145 Federal, State, local agencies, businesses, conservation organizations, and user groups participated in the planning effort. This included the following government agencies:

Blackfeet Tribal Council
Bonneville Power Administration
Bureau of Indian Affairs - Blackfeet Indian Agency
Bureau of Land Management
Cascade County Commissioners
Chouteau County Commissioners
Fergus County Commissioners
Glacier County Commissioners
Glacier National Park
Golden Valley County Commissioners
Governor's Planning Task Force
Governor's Natural Resource Council
Judith Basin County Commissioners
Lewis and Clark County Commissioners
Meagher County Commissioners
Montana Department of Fish, Wildlife, and Parks
Montana Division of Forestry
Montana Historical Society
Park County Commissioners
Pondera County Soil and Water Conservation District
Pondera County Commissioners
State of Montana - Office of the Governor
Sweetgrass County Commissioners
Teton County Commissioners
U.S. Department of Agriculture
U.S. Department of Air Force
U.S. Department of Health and Human Services
U.S. Department of Interior
U.S. Department of Fish and Wildlife Service
U.S. Environmental Protection Agency
Wheatland County Commissioners

HOW PUBLIC COMMENTS WERE USED

How Public Comments Were Used

Within the broad framework of Forest planning, public input is one of five considerations in the decision-making process. Forest Service decisions are based on five factors: 1) the law, 2) technical information, 3) resource capability, 4) professional judgement, and 5) public input. Public input enters into the decision-making process when there is room for interpretation in any of the first four factors, especially with regard to which uses will be emphasized. Public input, for example, would not be a factor in citing a violator of Federal regulations, but it does influence decisions about whether Forest management could emphasize one use versus another.

The Forest Service use of public comments is documented throughout the Final EIS and Plan. A summary of this documentation is as follows:

1) Public comments and the Forest Service responses to these comments are summarized in this chapter. Appendices E and F display the agencies, elected officials, and Indian Tribe comments, and the Forest Service response to each and lists the commentators to the DEIS and DEIS-Supplement. Appendix G, available for review at the Lewis and Clark Forest Supervisor's Office contains each comment letter along with the individual Forest Service response.

2) A summary of substantial changes between the Draft and Final statements is given in Chapter I. Throughout Chapters II (Alternatives) and IV (Environmental Consequences), changes are summarized and noted where they occur. A summary of changes to the Affected Environment, Chapter III, is discussed in the Introduction.

3) The consideration of comments collectively are addressed in this chapter and Chapter I. In this chapter, a summary of public comments are discussed by the major resource activity. In Chapter I, public comments are also summarized by the Forest issues, concerns, and opportunities.

In accordance with 40 CFR 1503.4, the comments about the proposed Plan or Draft EIS were treated in the following ways:

1) Comments offering technical corrections or pointing out inconsistencies have been used to revise the final documents.

HOW PUBLIC COMMENTS WERE USED

2) Comments requesting clarification or comments resulting from misunderstanding of what was meant in the documents indicate areas where the proposed Plan or EIS needed clarification. Corrections were made, or the reason a correction was not made is explained in the response to the comment.

3) Another type of comment questioned some part of the analysis. In some cases the analysis was clarified, supplemented, or modified. Where further analysis was not done, the reason was explained in the response to the comment.

4) Many comments suggested changes in the proposed Forest Plan direction, outputs, and land use assignments. These comments expressing a differing preference for Forest Service management required careful consideration both from an individual standpoint as well as a collective one. Where feasible and appropriate, management area direction in specific areas was changed in response to comments. However, some comments requesting changes in the proposed Plan did not result in any changes.

DEIS & PROPOSED FOREST PLAN

DEIS & Proposed Forest Plan

The public review period for the DEIS and Proposed Forest Plan began on July 26, 1982. The original 95 day comment period was extended by 30 days to November 30, 1982. During this time 800 DEISs and 1,200 Proposed Forest Plans were distributed to Federal, State, and local agencies and interested publics. Copies were also made available for review at Forest Service offices and local libraries.

The Forest hosted 24 meetings with special interest groups and Federal, State, and local agencies. Seven meetings were held with Forest Service personnel. Over 260 people participated in 12 public workshops.

Over 1,100 individuals, organizations, businesses, or agencies responded with 436 letters, oral responses, and petitions on the DEIS and Proposed Forest Plan. Commentators are listed in Appendix E. PW refers to "Public Workshop", LT to "Letter" and PT to "Petition."

Of the 436 comments--

38 were from businesses
29 were from conservation organizations
1 was from an educational institution
10 were from Federal agencies
348 were from individuals
3 were from local agencies
2 were from State agencies
5 were from user groups

Of the 436 comments--

285 were from the Forest's Zone of Influence
100 were from the rest of Montana
51 were from out-of-state

DEIS & PROPOSED FOREST PLAN

Most of the 436 commentators were concerned about several aspects of several resources. Therefore, each letter has numerous concerns. The total numbers by concerns, by resource, are listed below:

Resource	No. of Concerns
Recreation	373
Wilderness	382
Fish and Wildlife	602
Range	289
Timber	723
Minerals	274
Soil and Water	209
Lands	45
Facilities	384
Protection	56
Economics	248
Social	74
Alternatives	148
Management Areas	201
Administration	44
Environment	7
Multiple Use	30
Resources	18
RPA	12
Process	38

Following is a summary of the major comments on the DEIS and Proposed Forest Plan and the Forest Service response.

RECREATION

Of the 436 commentators to the DEIS and Proposed Forest Plan, 180 commentators (41 percent) had a concern with recreation.

Concern-Public Access

Several problems with public access to the Forest were mentioned. Many commentators felt that lack of public access denied them recreational opportunities. However, others felt increased access would hinder recreation quality and wildlife habitat.

Commentators

PW4, PW38, PW104, LT15, LT16, LT58, LT67 and LT217.

Response

The on-going Forest Lands Program's goal is to obtain rights-of-way as a means of providing long-term road or trail access to the National Forest. This program will follow the goals and objectives of different management areas in the Forest Plan. Specific rights-of-way needs are identified in Appendix C of the Forest Plan. (Also see Lands.)

Concern-Economics

The economic importance of recreation was highlighted in several comments. Income is generated for outfitters, guides, motels, sporting goods stores, and other businesses and eventually communities and the State. Some commentators felt that this income was not reflected when estimating the alternatives' effects.

Commentators

PW11, LT117, LT188, LT190, LT196, LT223, and LT245.

Response

The number of recreational jobs gained or lost in the different alternatives was calculated and included as part of the economic analysis in Chapter II. In response to public comment, this information is displayed by resource program in the FEIS. Compared to mining and logging jobs, recreational jobs have traditionally paid less and have generated less derivative income to the local economy.

Concern-Off Road Vehicles

Several people expressed a desire for more ORV restrictions, to protect recreation and wildlife and to reduce soil erosion. Others wanted less restrictions, to allow more motorized recreation and hunter access. Regarding snowmobiles, there were also conflicting opinions about restrictions. Some comments suggested separate snowmobile and cross-country ski areas. Some reviewers wanted the Travel Plan included in the Forest Plan.

Commentators

PW28, PW29, PW30, PW33, PW41, PW42, PW43, PW44, PW61, PW76, PW77, PW91, PW114, PW115, PW181, PW202, PW203, PW213, LT109, and LT222.

Response

The Plan calls for a continuing update and awareness of the demand for motorized and non-motorized recreation on the Lewis and Clark National Forest-with usage based on the ability of the resources to sustain such activity.

Many ORV restrictions are dictated by soil conditions, wildlife security, firewood availability, public safety, or desired type of recreation. The Forest Plan sets guidelines for open road densities. After extensive public review, a Travel Plan, which regulates motorized vehicle use, was implemented in April, 1985. The Travel Plan is scheduled to be reviewed yearly and revised as needed.

Concern-Campgrounds

A few commentators felt that the Forest Service should provide more campgrounds. Others felt that this was not needed, because they preferred dispersed motorized camping. Several commentators wanted better campground maintenance.

Commentators

PW20, PW21, PW78, PW79, PW223, LT79, and LT82.

Response

Our analysis was reviewed, but it still shows no need for new campgrounds until the year 2005. However, campers may occasionally be turned away from full campgrounds, especially on weekends and holidays. Maintenance of campgrounds is to increase.

Concern-Trails

Both snowmobilers and cross-country skiers wanted more groomed areas and marked trails. Some backpackers wanted more marked trails and expressed concern for logging activities near trails (especially National Scenic Trails in the Rocky Mountain Division). The State of Montana felt the Proposed Plan would reduce the amount of trails available and that no new trails are planned.

Commentators

PW43, PW91, PW104, PW117, PW202, LT32, LT118, LT124, LT155, LT190, LT203, and LT204.

Response

The Plan proposes to increase winter recreation opportunities in the Forest. For example, the Forest Service is working with local user groups to develop more facilities, coordinate funding from State programs for grooming, parking lots, and trail development. Also, the Plan emphasizes the promotion of the winter rental program for Forest Service cabins-to ensure increased recreation opportunities.

The Plan also proposes a system of winter trails for both motorized and non-motorized use. In response to public concern, the amount of trail construction/reconstruction has been increased. The final Plan calls for 100 miles of trail relocation and new construction each decade. Other resources should not be affected. Decisions on the trail work will be decided on a case-by-case basis as needs are identified. A five-year trail plan has been added to the final Plan. The recreation use of all trails is an important consideration in locating roads for timber harvesting. Each trail is analyzed to see if it should be retained for recreational purposes or if it will be replaced with road access.

Concern-
Dispersed Recreation

Many reviewers questioned the priority recreation received in the DEIS and Plan. The State of Montana felt dispersed recreation was not adequately addressed and that each type of recreational use should be considered. Other reviewers felt wildlife and recreation was not given enough consideration, while too much emphasis was given to timber. Others felt that recreation should not limit the Forest's development of other resources, especially regarding semi-primitive settings. Some commentators felt that not enough consideration was given for retaining semi-primitive settings and that changing them to roaded settings was unacceptable.

Commentators

PW69, PW129, PW146, PW232, LT3, LT10, LT38, LT44, LT46, LT47, LT61, LT109, LT113, LT118, LT147, LT150, LT155, LT172, LT199, LT239, and LT273.

Response

The Lewis and Clark National Forest will continue to provide a wide variety of dispersed recreation opportunity. Activities will range from those requiring a natural environment to those requiring a more developed setting (roads and campgrounds).

The Forest has reviewed the role of dispersed recreation in the Forest Plan. The Forest Plan analyzes a spectrum of dispersed recreation opportunities, from primitive to rural. This is more useful than an activity analysis, because of the wide variety activities that take place on the Forest and the overlapping setting in which they can occur. Because timber harvesting is a vital forest component which impacts many other resources, special consideration was given to find opportunities, costs, and benefits for different harvest levels.

The Forest Plan has attempted to balance all resource uses. In some instances recreation and wildlife do not have top priority, and in other instances they do. Many semi-primitive areas are not cost-effective to log and provide vital wildlife security habitat. However, some semi-primitive settings will be logged because they have a higher value for timber.

Concern-
Cultural Resources

Two letters questioned whether the Forest Service had coordinated the Plan with the State, in accordance with the Natural Historic Preservation Act.

Commentators

LT5 and LT93.

Response

Consulation with the State Historic Preservation Offices is an on-going practice. Specific procedures to comply with the National Historic Preservation Act are listed in the Forest Plan. The Plan was reviewed by the State's Historic Preservation Officer.

Concern-
Recreation in the Jefferson Division

Several commentators wanted Oti Park, Hoover Creek, Kings Hill, Deep Creek, Tenderfoot Creek, Pilgrim Creek, and Middle Fork of the Judith (all in the Little Belts) to be allocated to a non-timber management area. The commentators felt that the areas' recreational and wildlife values were higher than the timber harvesting values. Others, however, felt that these areas contained suitable timber for harvesting.

Commentators

PW36, PW55, PW63, PW64, PW67, LT6, LT8, LT29, LT91, LT120, LT156, LT191, LT195, LT208, PT225, PT227, PT230, LT237, and LT238.

Response

Based on further analysis Oti Park and Hoover Creek have been changed to Management Area F (semi-primitive recreation), to protect wildlife habitat. Parts of the Kings Hill area will be developed for timber products. Most of the Deep Creek, Tenderfoot, and Pilgrim Creek areas will be managed for semi-primitive recreation. It is not economically efficient to harvest timber in the area. The Forest Service is recommending that about 11,600 acres of the Middle Fork Judith, which have a high risk for the mountain pine beetle, be developed for timber products.

However, Congress has designated this area for wilderness study. No development would take place until Congress makes a decision on the area.

Concern- Recreation in the Rocky Mountain Division

Many comments expressed that the Rocky Mountain Division's best assets are wildlife, recreation, and scenic beauty -- and that these assets outweigh timber harvest and oil and gas leasing. Any road building was opposed. Many commentators wanted semi-primitive recreation management for the Two Medicine, Teton, Benchmark, Willow Creek, Elk Creek, and Falls Creek areas. The reviewers questioned the demand for timber, and whether the volume to be harvested from the Rocky Mountain Division justifies altering wildlife habitat and scenic beauty.

Commentators

LT6, LT30, LT62, LT68, LT76, LT114, LT119, LT120, LT130, LT132, LT134, LT142, LT149, LT152, LT153, LT161, LT171, LT173, LT174, LT177, LT178, LT179, LT180, LT186, LT188, LT193, LT197, LT199, LT202, LT211, LT214, LT216, LT219, LT221, LT242, LT244, LT246, LT247, LT248, LT249, LT250, LT251, LT252, LT253, LT254, LT256, LT257, LT259, LT262, LT263, LT266, LT270, and LT274.

Response

The Forest recognizes the high wildlife, recreation, and scenic values of the Rocky Mountain Division. Based on public comment and further analysis several changes in the management of the Division have been made. Under the final Forest Plan, the Rocky Mountain Division will be managed as follows:

	Final Plan
Wilderness	384,407 (50%)
Recommended Wilderness	51,834 (7%)
Wilderness Study	41,838 (5%)
Timber/Range	22,702 (3%)
Range/Wildlife	68,014 (9%)
Semi-Primitive Recreation	180,260 (22%)
Developed Recreation	4,664 (1%)
Wildlife	14,866 (2%)
Riparian	7,674 (1%)

Over 98 percent of the Division is classified as essential for the survival of the grizzly bear (Management Situation 1). About 95 percent of the Division will be managed in a primitive or semi-primitive recreation setting. Visual values will be emphasized on 96 percent of the Division.

In response to public concern, the small sale program on the Rocky Mountain Division has been reduced to 0.5 million board feet per year, this will provide an opportunity to meet local demand for post, poles, firewood, houselogs, and other miscellaneous wood products.

Concern - Summer Homes

One commentator wanted summer home permits to be terminated at the end of their tenure if the area is needed for public use

Commentators

PW110.

Response

Summer home permits may be terminated if they are incompatible with public interest or pose substantial physical conflict with public need. Also, termination can occur where permittees will not or can not correct existing or anticipated unacceptable resource degradation, safety hazards, or unsanitary conditions.

WILDERNESS

Of the 436 comments on the DEIS and Proposed Forest Plan, 135 commentators (31 percent) had a concern with wilderness allocation or wilderness management.

Concern-Rocky Mountain Division

Many people wanted the Rocky Mountain Division left alone, with no oil and gas development, timber harvest, or road construction. They felt the non-wilderness lands should be maintained as a buffer zone to the Bob Marshall Wilderness complex or added to it. These commentators saw the area as a natural treasure of beauty, recreation, fish, and wildlife, where the little gas or timber is not worth developing. A few commentators had the opposite views--that the Rocky Mountain Division should be developed or that the lands be available for multiple uses that wilderness classification preclu

Commentators

PW132, PW134, PW135, PW142, PW143, PW157, PW172, PW182, LT6, LT37, LT62, LT105, LT120, LT128, LT129, LT130, LT131, LT138, LT139, LT142, LT149, LT161, LT163, LT165, LT166, LT168, LT192, LT203, LT204, LT243, LT256, LT259, LT263, LT264, LT266, LT267, and LT270.

Response

The Forest has re-evaluated the wilderness potentia of roadless areas on the Forest, and has recommended 51,834 acres for wilderness classification. All of the recommended wilderness is on the Rocky Mountain Division. The Congress of the United States has retained the right to designate wilderness. Their decision will be incorporated into the Forest Plan.

Oil and gas leases have been issued for nonwilderness lands on the Rocky Mountain Division under the 1981 Environmental Assessment on Oil and Gas Leasin on Nonwilderness Lands. Stipulations to protect surface values have been included in the leases.

Stipulation	Acres
No Surface Occupancy	140,449
Limited Surface Use	58,770
Timing Restriction	
Elk and Deer Winter Range	67,375
Elk Calving	9,256
Sheep Lambing	9,229
Migration Routes	13,866
Raptor Nesting	202
Other	1,931
Activity Coordination	335,687
Further Planning	41,838

When the existing leases on the Forest expire, the issuance of new leases will be based on an analysis of current information, including oil and gas potential, as well as the goals and management objectives which were developed in consideration of T&E and other wildlife habitat needs, water quality, and other resource values.

Under the final Plan, the proposed timber harvest has been reduced to 0.5 million board feet per year.

Concern-
Oil and Gas Exploration in Wilderness

There were many contrasting views on oil and gas exploration in the wilderness. Those opposing it felt that any amount of gas was not worth the price of impacts to wilderness quality. One commentator felt that oil and gas can safely be developed in the wilderness and that the intent and legal mandate of the Wilderness Act should not preclude development.

Commentators

PW103, PW137, PW146, PW154, PW166, PW177, PW182, PW209, PW211, PW214, LT70, LT128, LT186, LT192, LT234, LT242, and LT256.

Response

Although the area was available for oil and gas leasing prior to the DEIS, classified wilderness was withdrawn from mineral entry and leasing on January 1, 1984.

Concern-
Wilderness Study

Many commentators made specific recommendations for wilderness study or recommended wilderness areas. Some people wanted unroaded lands on the Rocky Mountain Division added to the wilderness system. High wilderness quality and a desire to protect the areas from development were stated. Other commentators felt that the Bob Marshall Wilderness complex was large enough and that careful non-wilderness management of the areas would protect them.

On the Jefferson Division, some people wanted wilderness or at least semi-primitive recreation, with no timber harvest for the Middle Fork Judith. For the Big Snowies, some people felt that it is wilderness, and that formal wilderness classification should be recommended. Three commentators felt that both areas had good, representative wilderness qualities. Some commenters felt that neither the Middle Fork Judith nor Big Snowies should be wilderness, because of the need for more timber in White Sulphur Springs and Judith Gap.

Commentators

Renshaw: For Wilderness: LT6, LT30, LT60, LT164, LT192, and LT234.

Against Wilderness: PW118, PW119, PW153, and PW156.

Silver King: For Wilderness: LT6, LT60, LT164, LT192, and LT234.

Against Wilderness: PW128.

Deep Creek: For Wilderness: PW140, LT2, LT60, LT68, LT79, LT125, LT180, LT188, LT208.

Against Wilderness: PW137, PW153, and PW156.

Middle Fork Judith

For Wilderness Classification: PW29, PW75, PW76, PW92, PW101, PW181, PW182, PW202, PW203, LT2, LT3, LT4, LT6, LT11, LT44, LT68, LT117, LT161, LT172, LT240, and LT241.

Against Wilderness Classification: PW2, PW4, PW6, PW8, PW11, PW12, PW13, PW17, PW20, PW21, PW23, PW24, P25, PW27, PW31, PW55, PW58, PW61, PW82, PW85, PW106, PW184, PW201, PW218, LT43, LT51, LT59, LT72, LT120, and LT243.

Big Snowies

For Wilderness Classification: PW25, PW28, PW29, PW31, PW41, PW42, PW101, PW181, PW202, PW203, LT2, LT3, LT4, LT11, LT44, LT68, LT117, LT119, LT161, LT240, and LT241.

Against Wilderness Classification: PW6, PW8, PW12, PW13, PW26, PW27, PW30, PW53, PW55, PW58, PW61, PW62, PW85, PW106, PW201, LT43, LT51, LT59, LT72, LT120, and LT243.

Comments for wilderness classification - no specific area: PW67 and LT132.

Comments against wilderness classification - no specific area: PW136, PW137, PW164, PW177, LT25, LT102, LT116, LT137, LT141, LT162, and LT222.

Response

The Forest has re-evaluated the wilderness potential of roadless lands on the Forest. Under the final Plan, parts of the Renshaw, Silver King-Falls Creek, Teton, and Benchmark/Elk Creek areas were recommended for wilderness classification. These areas totaled 51,834 acres.

The Regional Forester will not make a recommendation on the Deep Creek-Reservoir North Wilderness Study Area until the area's oil and gas potential has been determined.

As part of the Forest planning process, the Regional Forester recommended nonwilderness for the Middle Fork Judith and the Big Snowies Wilderness Study Areas. Final recommendations on the Middle Fork Judith and Big Snowies Wilderness Study Areas will be made through a separate EIS. (Final decisions on wilderness designation are made by Congress.) If the areas are not classified as wilderness, the management prescriptions will apply as recommended in the Forest Plan.

Concern-
Future Demand

Several commentators felt the DEIS underestimated the future demand for wilderness recreation.

A few commentators felt that wilderness designation would attract too many users.

Some commentators wanted better trail and campsite maintenance in the existing wilderness.

Commentators

PW142, PW143, PW154, LT11, LT68, LT115, LT223, and LT238.

Response

The future demand for wilderness recreation is based on past use and population projections for Montana. They are the best estimates available and will be monitored to see if they are following projected trends.

Wilderness classification may attract additional recreational users. However, any such increases in either the Middle Fork Judith or Big Snowies are projected to be small.

The Forest Plan proposes increasing the Forest wilderness budget to enable managers to increase the number of wilderness personnel to boost the administration and trail construction and maintenance programs. This in turn will increase the area's ability to provide a primitive type experience for wilderness users.

WILDLIFE

There was a high degree of concern expressed about fish, wildlife, and their habitat. Of the 436 comments on the DEIS and Proposed Forest Plan, 205 (47 percent) dealt with on some phase of fish and wildlife management.

Concern- Elk and Elk Habitat

Many commentators expressed a concern with elk and elk habitat. Some commentators stated that timber harvest, livestock grazing, roads, and oil and gas activities impact elk, elk habitat, and hunting opportunities.

Another reviewer questioned why was it necessary to reduce grazing so severely to obtain the maximum elk benchmark. Several commentators wanted current elk numbers and hunting opportunities maintained. Another reviewer recommended including the elk-logging studies in the Forest Plan and thought Management Area B should provide for elk security. Other commentators felt timber harvest, grazing, and oil and gas activities were compatible. A few commentators thought that elk management received too much emphasis. Another reviewer thought the demand for quality elk hunting was going to increase. Two commentators emphasized the relationship of private lands and National Forest elk winter ranges.

A few reviewers questioned the State's goal for elk, while others thought State goals should be emphasized. One reviewer questioned the statement on page 2-20 DEIS, "Also concerns were expressed over the number of elk the Forest could provide." The reviewer wanted to know if the inference here was that there were too many or not enough elk.

Commentators

PW1, PW4, PW6, PW10, PW16, PW18, PW25, PW29, PW31, PW35, PW44, PW47, PW61, PW64, PW69, PW71, PW78, PW89, PW92, PW98, PW137, PW180, PW200, PW205, PW218, PW237, PW228, LT4, LT10, LT11, LT13, LT27, LT29, LT35, LT44, LT46, LT83, LT100, LT120, LT139, LT145, LT146, LT150, LT155, LT156, LT165, LT172, LT186, LT188, LT190, LT209, LT215, LT223, PT225, PT231, PT232, LT241, LT242, LT245, LT267, LT268, an LT273.

Response

The Forest has reanalyzed elk habitat management. The Forest Plan views elk habitat as a major resource and maintains the current population potential for 8500 elk. In response to this concern, several management practices have been added to minimize logging-related impacts on elk. The standards include: controlling the density of open roads, maintaining adequate security cover, locating roads so they don't block elk movement, and maintaining moist habitat sites.

Research findings from the Montana Cooperative Elk-Logging Study are the basis for several management recommendations which were designed to minimize logging-related impacts on elk. In response to public concern, these recommendations have been added to the Forest Plan as Appendix F. Recommended open road densities are now included for each management area and summarized in Appendix O. Management standards for other activities, such as grazing, roads, and oil and gas, have been designed to protect important elk habitat.

Management Area C has been expanded to 111,664 acres in the final Plan. The Plan's management direction for Management Area C has been rewritten to emphasize the importance of elk and deer habitat in the Castles, Crazies, Little Snowies, and the Little Belt Mountains. Although the area is also available for timber harvest, Management Area C provides elk hiding cover, has a low open road density, and a high potential for wildlife enhancement which emphasizes semi-primitive recreation.

In response to public concern, Management Area F has been added to the Forest Plan. Management Area F emphasizes semi-primitive recreation. More than 350,000 acres in large undeveloped blocks of Forest land will be maintained for elk and other wildlife in the Badger, Gibson Reservoir, Smith River-Tenderfoot, Middle Fork of the Judith, and Big Snowies.

Additional unroaded elk habitat has been added in the Hoover Springs, Oti Park, and head of the Smith River areas (Management Area F). These areas were identified by the State of Montana and other respondents as important elk security areas in 1982. Protection of elk migration routes (Management Area I) has been added to the Forest Plan adjacent to the Sun River and the Middle Fork of the Judith State Game Ranges.

On the Lewis and Clark National Forest there is a direct correlation between livestock grazing and the elk populations potential. The new Preferred Alternative (G) maintains the present elk population potential; however, by 2030 the hunting opportunity would decrease by 4,800 hunter recreation days annually (8 percent reduction). This reduction would result from increased access from timber harvest. Recreation use projections also shows the demand for elk hunting will increase.

The State's elk goal was a disaggregation of the State's goal from the 1970 Montana State-Wide Comprehensive Outdoor Recreation Management Plan (SCORP)--a strategic plan for the protection, perpetuation, and use of Montana's wildlife, fish, and recreation resources. Because of objections from the State, this goal has been dropped in the DEIS-Supplement.

Concerning the issue statement on page 2-20 DEIS, no inference was intended. The statement only identifies the public concern with the number of elk the Forest could provide. To eliminate any confusion, the issue has been removed from Chapter II of the DEIS-Supplement.

Concern-
Grizzly Bear and
Grizzly Bear Habitat

Many commentators voiced a concern for the threatened grizzly bears and their habitat. Reviewers felt timber harvest, grazing, road construction, and oil and gas activities could harm grizzly bear habitat. Specific concerns included poaching because of increased grazing, importance of riparian zones, and conflicts with sheep grazing. The State of Montana felt that methods of mitigating grizzly bear losses from oil and gas and mining have not been defined. A few people questioned the current grizzly bear population and that it did not change under any alternative.

The State of Montana felt the Plan implies that there is adequate baseline data for grizzly bears. Other reviewers thought timber and range guidelines to protect grizzly bears should be developed. Some commentators recommended all of the Rocky Mountain District remain undeveloped to protect the grizzly bear. Other commentators recommended only specific areas on the District, such as Two Medicine, Badger, and Patrick Basin.

The Department of Interior pointed out that the recovery goals on page 3-9 of the DEIS were not from the Fish and Wildlife Service as stated. The State of Montana felt that cumulative impacts to grizzly bears should be addressed in the Plan. One reviewer thought the grizzly bear recovery plan should be emphasized. A few commentators stated grizzly bears were compatible with resource development and that the bears did not need protection. The State questioned if the monitoring program will allow a high degree of accuracy in determining grizzly bear population trends.

Commentators

PW31, PW115, PW137, PW149, PW150, PW151, PW176, PW245, LT60, LT78, LT93, LT98, LT122, LT159, LT186, LT188, LT190, LT203, LT210, LT215, LT236, LT241, and LT273.

Response

The Lewis and Clark National Forest has reanalyzed grizzly bears and their habitat. Occupied grizzly bear habitat (all of the Rocky Mountain Division) has been identified according to "The Yellowstone Guidelines." More than 98 percent of the Division is in Management Situation 1 (areas that are essential for the survival of the grizzly). Seasonal ranges have been mapped. Important areas, such as feeding sites and denning areas, are being inventoried. This information has been added to the Forest Plan.

Formal consultation with the U.S. Fish and Wildlife Service has been completed and is included in the final EIS and Forest Plan. It was their opinion that implementation of the revised Forest Plan would not jeopardize the grizzly bear.

In response to public concern, Management Standards were developed and included in the Revised Proposed Forest Plan for timber harvest, livestock grazing, oil and gas activities, and roads, to insure that grizzly bears and their habitat are protected. No direct losses of grizzly bears have ever been attributed to oil and gas or mining activities on the Front. However, these activities can displace bears. Habitat capacity for 85 bears would be provided under all alternatives, although the quality will change as described in Chapter II. The population estimate has been revised from the DEIS and is based on the latest information. The recovery goal in the DEIS

is the Northern Region disaggregation of the recovery goal for the Northern Continental Divide Grizzly Bear Ecosystem as identified in the DEIS-Supplement and FEIS. The Forest is committed to achieving a recovered population of grizzly bears. Also a process (known as the Cumulative Effects Process) has been developed to evaluate how specific forest projects can affect the grizzly. This process has been added to the Revised Proposed Forest Plan as Appendix L. The process has been updated in the final Plan.

It was not the intent to imply that adequate baseline data for grizzly bear exists. Although grizzly bears have been studied for over 25 years, site-specific information is needed and the Forest is committed to obtaining it through the Interagency Monitoring and Evaluation program. (See Forest Plan, Appendix H.) We feel the available data will allow for determining grizzly bear population trends with a high degree of accuracy. The Plan calls for 100 acres of habitat to be improved annually for the grizzly. Most of this improvement will be accomplished through the use of "prescribed fire" (controlled burning) to improve spring range.

Concern-
Gray Wolf

Several commentators expressed a concern with the endangered gray wolf. Reviewers thought that with the activity level planned for the Rocky Mountain Division, the population would not remain static. One reviewer emphasized the importance of the Rocky Mountain Division to the wolf. Another thought the wolf had been studied to death. One reviewer did not want wolves planted in the area, because of conflicts with livestock.

Commentators

PW15, PW150, PW151, LT93, LT186, LT203, LT210, LT215, and LT236.

Response

Formal consultation with the U.S. Fish and Wildlife Service has been completed and is included in the final EIS and Forest Plan. It was their opinion that implementation of the revised Forest Plan would not jeopardize the gray wolf. Recovery of the endangered gray wolf population is linked to the Forest's management of grizzly bear habitat. The Forest Plan also calls for maintaining a suitable prey base and habitat for the gray wolf. Habitat capacity for 10 wolves would be provided under all alternatives. The recovery goal is the Northern Region disaggregation of the recovery goal for the Northern Rocky Mountains, as identified in the DEIS-Supplement.

Concern-
Threatened and Endangered Species

Several commentators discussed threatened and endangered species. Reviewers thought that a biological evaluation should be completed and formal consultation should be initiated with the Fish and Wildlife Service. One reviewer thought more emphasis should be put on recovery of these species. Another reviewer questioned the Forest Service's ability to control access into the Two Medicine area, because of the Blackfeet Indian Treaty Rights. One reviewer felt that too much emphasis was placed on T&E species.

Commentators

LT93, LT131, LT145, LT200, LT223, LT236, LT241, LT263, and LT267.

Response

Formal consultation with the U.S. Fish and Wildlife Service on the Forest Plan has been completed and is included in the Final EIS and Forest Plan. It was their opinion that implementation of the revised Forest Plan will not jeopardize T&E species. Management Standard C-2, Threatened and Endangered Species, in the Revised Proposed Forest Plan has been rewritten to strengthen compliance with the Endangered Species Act. The Blackfeet Indians have retained right for access in the Two Medicine area. However, the full implications of this right in the Badger-Two Medicine area is not clear. The Forest Service, BIA, and Blackfeet Tribe are participating in on-going negotiations to clarify and resolve issues, including road use control, which are related to the Treaty Rights situation.

Concern-
Wildlife Habitat

Many commentators expressed a concern with wildlife habitat management. Several commentators disapproved of increased livestock grazing because of its effect on big-game. Some commentators specifically identified elk winter range and elk security habitat as key concerns. Other commentators felt that grazing did not bother wildlife. A few reviewers stated that timber harvest could be used to improve wildlife habitat, including winter range, and that elk security will be replaced. Others felt the level of timber harvest was detrimental to wildlife. A few commentators questioned the effect of oil and gas activities on wildlife habitat. Two commentators questioned the relationship between big-game AUMs and livestock AUMs. One reviewer felt that the management area's goal did not adequately address the needs for big-game. A few commentators expressed a concern for snag management and identified the need for a snag management policy. Two commentators wanted a better definition of acre equivalents.

Commentators

PW2, PW10, PW24, PW25, PW29, PW44, PW62, PW64, PW74, PW76, PW77, PW97, PW129, PW148, PW198, PW223, LT35, LT38, LT43, LT44, LT45, LT48, LT62, LT68, LT69, LT77, LT80, LT100, LT113, LT115, LT150, LT165 LT188, LT193, LT195, LT199, LT208, LT214, LT223, PT224, LT234, LT235, LT239, LT240, LT241, LT242, and LT243.

Response

The Forest has reanalyzed wildlife habitat management. The Forest Plan has been revised to promotes high quality wildlife habitat. More than 700 acres of habitat will be improved annually. In response to public concern, the grazing level under the Preferred Alternative (G) has been reduced to 73,600 AUMs (2030) in the DEIS-Supplement. This is a three percent increase over the current level. No additional grazing will be planned on big-game winter range or riparian zones, unless wildlife needs can be fully met. Timber harvest can be used to improve big-game habitat, as in Management Area C. Management Area C has been redefined to provide additional elk security and has been expanded to include 111,664 acres in the final Plan, which have been identified as important elk habitat. Practices to maintain or improve wildlife habitat are included in every management area. Oil and gas management guidelines have specific requirements to protect wildlife habitat.

Standards for wildlife trees and old-growth forest have been added to the Revised Proposed Forest Plan. Standards for wildlife trees set the number of snags to be maintained-by timber type for each 100 acres. Old-growth habitat standards call for maintaining at least five percent in an old-growth condition for birds and animals such as the goshawk and the pine martin. Acre equivalents is a term used to measure wildlife habitat improvement. In response to National direction, the unit of measure has been changed to acres.

Concern-
Management
Activities on Wildlife

Many commentators expressed a concern with the effect of management activities on wildlife. Some specifically identified oil and gas activity and timber harvest as having adverse impacts. Two commentators thought firewood cutting should be limited to certain times, to protect wildlife. Other commentators felt timber harvest would help wildlife, that oil and gas activity would not harm wildlife, and that oil and gas guidelines reduced the oil and gas opportunity. A few reviewers identified other wildlife issues, such as black

bear and bighorn sheep management, that they felt should be included. Some reviewers thought that the Plan was not acceptable from a wildlife standpoint, because wildlife needed more consideration. A few reviewers questioned the use and accuracy of wildlife population estimates; others felt that the population estimates and predicted changes were not correct.

Commentators

PW15, PW38, PW40, PW46, PW60, PW82, PW87, PW114, PW152, PW154, PW156, PW162, PW166, PW176, PW193, PW200, PW201, PW202, LT6, LT10, LT11, LT35, LT38, LT40, LT59, LT78, LT81, LT84, LT86, LT89, LT90, LT105, LT109, LT113, LT115, LT139, LT145, LT148, LT161, LT162, LT165, LT175, LT180, LT188, LT190, LT209, LT210, LT211, LT212, LT215, PT225, LT234, LT240, LT241, LT242, LT245, LT265, and LT273.

Response

The analysis of the effects of wildlife resource program on habitat has been modified. Management activities, such as oil and gas and timber harvest, have been designed to minimize the impact on wildlife. Forest-Wide Management Standards provide the overall direction. Each management area prescription has practices to maintain or improve wildlife habitat. These have been carefully reviewed by the planning team and wildlife biologists from cooperating agencies. Management standards for wildlife coordination have been rewritten in the revised Plan to strengthen wildlife protection. Also, other management standards have been reviewed, and additions and changes have been made to strengthen wildlife protection. These standards provide the needed coordination and protection for wildlife.

Firewood cutting is limited to certain time periods in many areas to minimize impacts on wildlife. While no specific direction is established for black bears or bighorn sheep, the overall guidelines provide for the needed habitat management.

Wildlife population estimates are based on the best current information and are essential to evaluate changes and monitor results. Predicted changes in population potentials are made by wildlife biologists and although subjective, are based on actual habitat change.

Concern-
Road Management

Many commentators discussed the impacts of roads on wildlife, especially big-game. Several reviewers emphasized a need for more road closures. A few commentators thought that with a more aggressive road closure program, timber harvest levels could

be increased. A few commentators discussed the effects of motorbikes and snowmobiles on wildlife. The State recommended consideration of the Department of Fish, Wildlife, and Parks road management policy.

Commentators

PW6, PW8, PW20, PW21, PW23, PW28, PW43, PW44, PW47, PW51, PW55, PW62, PW80, PW82, PW92, PW101, PW134, PW146, PW152, PW181, PW200, PW218, PW232, LT4, LT35, LT80, LT90, LT115, LT120, LT146, LT188, LT201, LT207, LT236, LT243, LT245, and LT273.

Response

Roads have a significant impact on wildlife as discussed in Chapter IV. In response to public concern, open road densities have been established for all management areas. The Forest-Wide Management Standard for Travel Planning was rewritten to be more specific.

The Forest is currently administering a Travel Plan approved in April, 1985. Wildlife habitat protection and maintenance are an important consideration in Travel Planning. The Travel Plan was initiated only after considerable public comment and review by the Montana Department of Fish, Wildlife, and Parks. The Plan will be reviewed annually and updated as needed.

The Montana Fish and Game Commission adopted a road management policy in October, 1982. (See Forest Plan, Appendix G.) The Montana Department of Fish, Wildlife, and Parks uses the policy as their guideline for coordinating road management with other land management agencies. The Northern Region has established a Regional policy on road regulations. This direction has been added to the Revised Proposed Forest Plan (Forest Plan, Appendix G).

Wildlife, especially elk, need a variety of habitats, including security cover. On the Lewis and Clark National Forest, unroaded areas provide the most security. Over 745,000 acres of unroaded habitat will be available in the Rocky Mountain Division, and 558,000 acres in the Jefferson Division. Off-road vehicle use and impacts are considered in Travel Planning.

Concern-
Fish and Fish Habitat

Many commentators discussed the importance of fish and fish habitat. Reviewers indicated increased sedimentation and its impact on catchable trout populations was not acceptable. Reviewers mentioned the uniqueness of the Upper Missouri River (blackspotted) cutthroat trout. Some commentators emphasized maintaining the high quality water and

fishing that is available on the Forest. One reviewer thought the DEIS failed to adequately address the impacts of Forest activities on fisheries. Three commentators stated that effects on downstream fisheries were not analyzed. Some commentators listed specific creeks where fish habitat should be protected. The State of Montana felt that fish habitat should have been a issue relative to logging activities and that streams having excellent fish population should be identified.

Commentators

PW44, PW62, PW87, PW154, LT4, LT68, LT83, LT143, LT172, LT176, LT188, LT193, LT198, LT203, LT215, LT223, PT225, LT238, LT245, and LT273.

Response

The Forest has reanalyzed fish habitat management. Management Standard C-3, Fish Habitat, has been rewritten to strengthen fish habitat protection. (See Revised Proposed Forest Plan.) Included in this guideline is the direction to, "Emphasize the maintenance or enhancement of habitat supporting populations of Upper Missouri River (blackspotted) cutthroat trout". The grazing level under the Preferred Alternative (G) has been reduced to 72,600 AUMs.

This action reduces the projected sediment increase from the 1982 DEIS and maintains the current catchable trout population. A discussion of the impacts on the habitat supporting populations of blackspotted cutthroat trout has been added to the Revised Proposed Forest Plan. The discussion of impacts to the fisheries resource in Chapter IV has been expanded and includes downstream effects (also see Soil and Water in this chapter). Fish in relation to logging was not identified as an issue, although the Forest recognized the potential effects.

Concern-Riparian Areas Management

Several commentators stated the importance of riparian area management for wildlife and fish habitat. Reviewers indicated increases in grazing and timber harvest were not acceptable. The importance of riparian areas for grizzly bear was emphasized by one reviewer.

Commentators

PW203, LT43, LT44, LT46, LT143, LT172, LT188, LT201, LT210, LT233, LT241, and LT245.

Response

The Forest Plan recognizes the importance of riparian area management for wildlife. In response to this concern, Management Area R, Riparian Zones, has been rewritten in the Revised Proposed Forest Plan. The Forest-Wide Management Standards R-1, Riparian

Zone Management, and W-1, Wetland Zone Management, have been expanded and incorporated into other management standards which deal with a particular activity. (See Forest Plan, Management Standards D-3, E-4, F-3, G-1, G-2, and L-4.) Riparian area management for grizzly bear is included in these standards.

Concern-
Wildlife Management in Specific Areas

Commentators

Several reviewers identified specific areas where wildlife management should be emphasized.

Rocky Mountain Division:

PW193, PW218, LT38, LT60, LT62, LT131, LT132, LT138, LT168, LT180, LT193, LT196, LT202, LT235, LT238, LT240, LT242, LT256, and LT267.

Wagner Basin: PW258.

Badger-Two Medicine: LT6, LT38, LT53, LT62, LT83, LT93, LT119, LT159, LT180, LT188, LT208, LT235, LT236, LT244, and LT267.

Teton: LT244.

Lubec-Heart Butte: LT38, LT53, LT93, and LT188.

Deep Creek-Reservoir North: LT6, LT79, and LT242.

Falls Creek-Renshaw: LT30 and LT192.

Sawtooth: LT30.

Sawmill: LT165.

Hogback-Wood Creek: LT6.

Ford Creek: PW198.

Benchwillow: PW244.

Jefferson Division:

Oti Park-Hoover Springs: PW235, PW237, PW239, LT6, LT29, LT34, LT91, LT156, PT227, PT231, LT238, LT245, LT258, and LT273.

Middle Fork Judith: PW10, PW16, PW20, PW23, PW36, PW101, PW182, LT4, LT44, LT46, LT50, LT108, LT156, LT158, LT172, LT193, LT208, LT211, PT224, LT234, LT240, LT241, LT243, LT245, LT258, LT268, and LT273

Northwest Little Belts: LT188, LT191, LT195, and PT224.

Tenderfoot-Deep Creek-Pilgrim Creek: LT8, LT156, PT224, PT225, PT231, and LT238.

Big Snowies: LT39, LT108, LT193, LT234, and LT243.

South Fork Judith: LT156.

Smith River: LT237.

North Fork Smith River: LT245 and LT273.

Wolf Creek: PW18 and PW25.

Placer Snow: PW10.

Bozeman Fork Road: PW36.

West End/East End Castle Mountain: PW36, LT245, and LT273.

Pasture Gulch Road: PW36.

Crazy Mountains: LT100 and LT238.

Highwood Mountains: PT224 and LT238.

Carpenter: LT208.

Allen Park-Eagle Creek and Lake Creek: LT245 and LT273.

Response

The entire Forest has been carefully reviewed by the planning and management teams to insure that identified values are protected and that the management areas are suitable for the proposed activities. Several changes in management areas have been made.

Concern-
Monitoring Requirements

A few commentators addressed the monitoring requirements for fish and wildlife. Reviewers questioned why indicator species were not included in the monitoring plan. They did not feel the allotted costs were adequate. The State of Montana felt that monitoring criteria for initiating the evaluation of existing management practices should be more strict. One reviewer thought a brief description of the fisheries' monitoring should be included in Chapter IV of the Forest Plan. One reviewer thought checking territories is a tough

way to monitor wildlife. Another questioned, what is an elk-timber relation model? And still another thought old-growth habitat should be monitored. The State recommended an additional monitoring requirement of bull elk harvest greater than 40 percent during the first week of the elk hunting season. One reviewer thought wildlife that is displaced should be monitored. Another questioned the ability of the Forest Service to monitor revegetation projects.

Commentators

PW44, PW176, PW200, LT35, LT93, LT223, and LT273.

Response

Monitoring requirements are discussed in Chapter VI of the Revised Proposed Forest Plan (Chapter V, final Plan). The monitoring requirements for fish and wildlife have been rewritten. Indicator species which may be affected by the Forest Plan have been included in the monitoring plan. The criteria for further evaluation for some species, such as the grizzly bear and wolf had been made more restrictive. Many wildlife species are very difficult to monitor. We have proposed a way to monitor such species and still be cost-effective. Monitoring costs are incorporated into the total cost in managing an activity. The costs identified were additional costs to current direction, not the total cost. To avoid confusion, these costs have been omitted. The elk-timber relation model was developed to evaluate the effect of timber harvest and road building on elk habitat effectiveness. Old-growth habitat has been added to the wildlife monitoring requirements.

Intensive studies on the effects of oil and gas activities on wildlife are on-going on the Rocky Mountain Division in cooperation with the U.S. Fish and Wildlife Service, BLM, and Montana Department of Fish, Wildlife, and Parks. Guidelines from these studies will be used in the management of wildlife species. Management guidelines for the grizzly bear, elk, mule deer, mountain goat, bighorn sheep, and raptors have been approved by the U.S. Fish and Wildlife Service, the Bureau of Land Management, the Montana Department of Fish, Wildlife, and Parks, and the Forest Service. These guidelines have been added to the Forest Plan as Appendix I. We feel confident in meeting the monitoring requirements; however, as with any new program, monitoring needs the test of time. Monitoring will undoubtedly lead to change and hopefully improve the management of the Lewis and Clark National Forest.

RANGE

Of the 436 comments on the DEIS and Proposed Forest Plan, 116 commentators (38 percent) had a concern with range allocation, range management, or effects of the range program on other resources, especially wildlife.

Concern-
Grazing Level

Many commentators expressed an opinion on the grazing level. Most commentators recommended less grazing because of the need to protect wildlife habitat, especially elk winter range and T&E species. Riparian areas, soils, and water quality were concerns of other reviewers. Some commentators were critical of range administration and lack of range improvement maintenance. Other commentators felt levels of use, range trend, and grazing system should be displayed. Several commentators recommended continuation of current grazing levels. Several commentators recommended increases in grazing. Commentators listed benefits to wildlife, increases in red meat production, and increases in grazing opportunities on transitory range as reasons for this recommendation. Some people qualified increase grazing with "small increase," "modest increase," "not on winter range," "with improved range administration," and "only on suitable acres without conflicts." One reviewer stated that type conversion could also be used to increase grazing.

Commentators

Less Grazing: PW21, PW73, PW76, PW77, PW98, PW133, PW21, LT3, LT10, LT13, LT35, LT40, LT43, LT45, LT68, LT69, LT77, LT113, LT172, LT190, LT209, LT212, LT215, PT227, LT241, LT245, and LT268.

Current Grazing Level: PW120, PW121, PW132, PW142, PW152, PW200, PW202, LT43, LT155, LT175, LT203, and LT204.

More Grazing: PW69, PW82, PW114, PW129, PW133, PW135, PW213, LT36, LT123, LT188, LT193, LT222, and LT273.

Response

The level of grazing has been reanalyzed. The new Preferred Alternative (G) increases the grazing level slightly - to about 800 more cattle over the next 50 years. Range and wildlife specialists carefully reviewed the opportunity to increase grazing while maintaining big-game winter range and riparian area values. Alternate grazing levels could be implemented, but specialists recommend no additional grazing on big-game winter range or riparian areas, unless wildlife needs could be

fully met. Most of the increase will be in the Little Belt Mountains, with minor increases in the Snowies and the Rockies. Allotment plans will determine exactly where the increases will be. The Highwoods and Castles will continue to support approximately the current levels of grazing. The revised Plan calls for a higher level of prescribed burning (1,600 acres annually compared to 300 acres which are currently being burned) to increase forage production. Fences, water developments, and other structural range improvements will be continued at the current level. Allotment types, grazing systems, suitable range, and current grazing level are displayed for each allotment in the Revised Proposed Forest Plan (Appendix Q).

Concern-
Range Management Program

Many reviewers made general comments on the range management program. These comments included using improvements to prevent overuse, using grazing fees for range improvements, using fire to improve range conditions, and using Forest Service crews to maintain improvements. Some commentators felt specific areas of the Forest were overgrazed or poorly administered. One reviewer thought grazing was given too much emphasis. Others emphasized the need for wildlife and riparian area protection. Another did not want areas presently closed to grazing to be opened. A few commentators criticized the permits system and fee charged for grazing, two commentators criticized the artificial water tank (trick tank) in McGee Coulee. One reviewer thought the 20-year replacement schedule for range improvements should be more flexible.

Commentators

PW78, PW94, PW96, PW97, PW113, PW118, PW128, PW129, PW146, PW154, PW175, PW188, PW201, PW218, PW223, LT25, LT32, LT82, LT113, LT115, LT157, LT188, LT245, and LT273.

Response

The range improvement programs stress cooperation and shared costs with permit holders. Over 430 miles of fence, 375 water developments, 75 cattleguards, and 15 miles of water transmission pipeline have been constructed under this program. Fifty percent of all grazing fees are returned to the Forest for range betterment programs. Under the Forest Plan, over 1,600 acres are scheduled for range burning yearly. Range improvement maintenance is part of the permittee's responsibility and is a consideration in the grazing fee structure. The Forest administers 250 allotments.

Range administration has the highest priority for range management funds. Livestock grazing is one of the major uses of the Forest. The Forest ranks 3rd of 13 Forests in the Northern Region in number of AUMs.

In response to public concern, Forest-Wide Standards have been developed to protect riparian areas and T&E species in the revised Plan. Forest-Wide Standards have also been established which identify areas where protection of other resources prohibits grazing. The Forest has no plans to open these areas to livestock grazing.

Grazing fees are determined by a formula set by the Public Rangelands Improvement Act. The Forest Service and Bureau of Land Management are making a joint appraisal of the fair market value as part of a total review and evaluation of the way grazing fees are established. Permits are issued through Secretary of Agriculture Regulations 36 CFR 222.3 through 222.7. To qualify to hold a term grazing permit an applicant must own base property and permitted livestock. The purpose of this requirement is to promote the stability of the local livestock industry. Structural range improvements, such as water developments and fences, are designed to improve grazing distribution and lessen the impact on the riparian zone. The 20-year replacement schedule for range improvements is for programming funds; actual replacement is more flexible and is done by case-by-case basis.

Concern-
Noxious Weeds

Several reviewers commented on noxious weeds and the Forest program to control them. Most commentators felt the Forest should increase its program. They recommended prevention, biological control, and more coordination with the State and counties. Two commentators mentioned other range problems, such as sagebrush which can be controlled by burning.

Commentators

PW115, PW117, PW129, PW131, PW219, PW224, LT27, LT115, LT188, LT189, LT213, and LT273.

Response

Information on the noxious weed program has been supplemented. Noxious weed control programs emphasizes cooperation with other landowners, and the prevention and control of noxious weeds using integrated pest management methods. Over 1,000 acres on the Forest have been identified as being infested with noxious farm weeds. The Forest is supplementing appropriated funds with the range

betterment fund, cooperating with county weed district efforts, and through permittee cooperation in the form of contributed labor, equipment and/or the deposit of matching funds. In FY 1985 over 500 acres were treated.

The Forest is cooperating with County Weed Boards in controlling noxious farm weeds to ensure a coordinated approach to this widespread problem. In Cascade, Teton, and Chouteau counties, the county weed control crews are spraying weeds on the National Forest in a cooperative effort with the Forest Service. In the Marias River Basin, the Forest is represented on a Multi-agency Steering Committee that has recently organized to involve all landowners in the watershed in a cooperative weed control effort.

Biological weed control agents are being utilized, as they become available, in an integrated pest management effort. Insects that attack musk thistle and spotted knapweed have been released on the Forest in cooperation with the Rangeland Insect Laboratory. The Management Standard for Noxious Weeds, D-2, has been rewritten to emphasize prevention in response to public concern.

The Forest Plan has scheduled about 1,600 acres of burning for range improvement annually.

Concern-
Effects of Grazing on Other Resources

Several commentators thought the DEIS did not prope address the impacts of increased grazing on T&E species, elk, other big-game species, fish habitat, soil, water, and timber harvesting. One reviewer felt Alternative F would reduce the elk population. The reviewer also felt hunter recreation would be an economic loss, as a result of increased grazing. Commentators questioned how coordination with other resources could minimize grazing impacts. Two commentators thought current conditio of the range, status of riparian areas, and standards for forage allocation should be included in the EIS and Plan. Another reviewer thought riparian zone mitigation measures should be included. One reviewer thought it was a mistake to predict additional AUMs before determining the land's carrying capacity. Some commentators wanted erosion caused by grazing to be a public issue.

Commentators

LT38, LT93, LT115, LT165, LT176, LT188, LT241, and LT273.

Response

The effect of grazing on T&E species, elk, other big-game species, fish habitat, soil, and water are discussed on pages 4-34 and 35 in the DEIS-Supplement. How grazing affects timber management is discussed on page 4-41. These sections have been reviewed and some additions or changes have been made in response to public comment. The phrase, "without mechanical damage and/or vegetative damage," has been removed. The alternatives listed are those in which range and big-game values would most often be in conflict. Timber harvest and grazing are the major contributions to income and employment. Their economic benefits outweigh those lost in hunter recreation. Range condition has been added to the monitoring requirement of the revised Plan.

Range utilization standards are a part of each management practice. Additional grazing allocation is based on output coefficients developed by range management specialists for the Forest. These have been carefully reviewed and validated by range and wildlife specialists from each Ranger District using a new computerized range management information system (FSRAMIS), and reviewing each allotment. The Forest feels the projected levels are accurate and implementable. Erosion caused by grazing was not identified as an issue, although the Forest recognized the potential effects on soil and water resources. Standards for riparian areas, soils, and water protection set management practices for grazing by protecting these values. Livestock restrictions identify areas that have been closed to grazing for watershed, wildlife, and other resource protection. These standards have been added to the revised Plan.

Concern-
Grazing Agreements

One reviewer thought the Forest Plan severely impacts effective range management by retaining existing range agreements with other agencies and landowners, when livestock reductions may be needed. Other commentators felt that range benefits were overstated and that the Plan violates Forest Service policy by increasing grazing on the Lewis and Clark National Forest. Two commentators questioned why the monitoring plan for range condition and trend would have only moderate precision and reliability. Two commentators questioned the term, "significant increase" in the range monitoring plan. The other reviewer suggested including management standards for grazing to protect T&E species habitat. Two commentators thought range condition and range utilization standards should be included in the Plan.

Commentators	LT223, LT241, and LT273.
Response	Range agreements provide for cooperative planning and management of intermingled private, State, other Federal, and National Forest lands. Agreements do not set the level of grazing. This is done through range analysis and the permit system carried out by the Forest Service. The range economic values are based on studies done by USDA-Economic and Statistics Services, specifically for the Lewis and Clark National Forest and are consistent with economic guidelines for Forest planning. The expected precision and reliability for monitoring range condition and trend was rated as moderate, because only about 10 percent of allotments are analyzed yearly. However, the monitoring of an individual allotment has a high level of precision and reliability. In the Monitoring Plan, the requirements for monitoring the range resource has been revised. A standard for range management, including protection for T&E species, has been added to the revised Plan. Grazing which affects grizzly bear and/or their habitat will be made compatible with grizzly needs on such uses will be disallowed or eliminated. Range condition has been added to the Monitoring Plan. Range utilization standards are a part of each management practice.

TIMBER

Concern- Amount of Timber

Of the 436 comments on the DEIS and Proposed Forest Plan, 295 commentators (68 percent) dealt with timber allocation or management.

Numerous reviewers commented about the amount of timber harvested. Comments varied from decreasing the proposed amount to increasing the proposed amount.

Of those desiring an increase in harvest levels, two reasons were almost exclusively mentioned: jobs and community stability and potential losses from insect and disease. Two communities figured heavily in this group: White Sulphur Springs and Judith Gap. A number of letters not from these two communities mentioned relatives or friends from these communities.

Of those desiring a decrease in harvest levels or no harvest, reasons fell primarily into three areas: wildlife, especially elk; soil erosion and water quality; and, fish (related to water quality).

Wildlife concerns were expressed on the Rocky Mountain Division of the Forest and in the Little Belts. Water quality concerns often were related to steep slopes. Also often expressed was the philosophy that the Lewis and Clark was not a timber forest. Some of those against an increase from present levels of harvest would support shelterwood cuts.

Commentators

Decrease proposed harvest: PW59, PW76, PW98, PW144, PW180, PW181, PW187, PW200, PW218, LT3, LT39, LT214, and LT245.

Keep harvest at present level: PW8, LT69, LT182, LT201, and LT203.

Disagree with proposed level: PW15, PW91, LT31, LT38, LT40, LT44, LT45, LT98, LT113, LT116, LT143, LT155, LT175, LT190, LT193, LT201, LT208, LT215, LT224, LT225, LT241, LT245, and LT265.

Agree with proposed level: PW4, PW85, PW104, PW114, PW121, PW129, PW140, PW141, PW143, PW146, PW153, PW155, PW157, PW162, PW164, PW172, PW196, PW232, LT68, LT79, LT84, and LT90.

Increase proposed level of harvest: PW71, PW135, PW136, PW150, PW156, LT80, LT87, LT88, LT89, LT92, LT95, LT101, LT102, LT103, LT104, LT105, LT106, LT108, LT120, LT123, LT127, LT135, LT136, LT137, LT140, LT141, LT146, LT147, LT150, LT181, LT184, LT222, LT239, and LT243.

Response

The Forest carefully reviewed the proposed level of timber harvest in relationship to the supply potential, demand, effects on other resources, and net public benefit. While the Forest is capable of producing 68.3 million board feet of timber on 675,690 acres, many areas of the Forest are costly to access and would be better managed for other values. In other areas while timber management is an appropriate use, there is a need to restrict or modify the harvest level to protect or maintain other values. All of these values and the trade-off associated with different types of management were evaluated and the Forest feels the Preferred Alternative provides the greatest net public benefit. Timber management will be practiced on 282,307 acres of suitable land in the final Plan. Under the final Plan, 14 million board feet will be offered for sale annually, (.5 on the Rocky Mountain Division and 13.5 on the Jefferson Division). The harvest level increases to 20 million board feet by the third decade.

Sawmills at Judith Gap, Townsend, Livingston, and Choteau have an annual one-shift, production capacity of about 50 million board feet. Currently the Forest supplies about 20 percent of this production capacity. By the year 2000 the Forest will be supplying 40 percent. The Forest contains about 40 percent of the areas commercial Forest land. Therefore, the sawmills must continue to rely on private lands for much of their supply.

The Forest is confident that the timber level can be increased while maintaining wildlife, and protecting soil and water quality. This balanced timber supply base will provide the greatest net public benefit for the management of the Lewis and Clark National Forest.

Concern-
Timber Harvest in Certain Areas

Numerous commentators were against timber harvest in particular areas with a few comments favoring timber harvesting in certain areas. Many commentators were against increasing the timber harvest level on the Rocky Mountain Division.

Opposition to harvest on the Rocky Mountain Division related to wilderness, recreation, roadless management, and wildlife. Proposals for the Rocky Mountain Division generated a relatively large "Keep the Rocky Mountain Front like it is" response. Many reviewers question the economics of harvesting timber on the Rocky Mountain Division.

Areas specifically mentioned on the Rocky Mountain Division were:

Badger-Two Medicine
(Lower Pike Creek, South Fork Two Medicine)
Benchmark-Willow
(Fairview Creek, Wood Creek, Welcome Creek Pass, Petty Creek)
Elk Creek-Falls Creek (Cyanide Creek, Elk Pass)
Teton
(North Fork Teton, West Fork Teton, Olney Creek, Green Gulch, Mill Falls, Mill Flats, Sawmill Flats, Waldron Creek)
Deep Creek
Lubec-Heart Butte
Home Gulch
Sawtooth

Those comments in favor were generally landowners next to the Forest or nearby. Often these comments were expressed as "A little timber harvest will be okay on the Front."

In the Jefferson Division, opposition to timber harvest levels as proposed were centered around undeveloped areas. Middle Fork Judith led the specific areas of concern (primarily due to its status as an MWSA area). The Middle Fork was also mentioned by commentators supporting proposed harvest levels and those desiring an increase in harvest.

Areas specifically mentioned in the Little Belts were:

Middle Fork Judith
(Lost Fork, Weatherwax, Harrison Creek, Cleveland Creek, Etten Ridge)
Hoover Creek-Oti Park
(Carpenter Creek, Lucy Park)
Deep Creek-Tenderfoot
(Rugby Creek, Central Park, Iron Mountain)

Smokey Unit
(Corridor, Deadman)
Logging Creek
Pilgrim Creek-Thunder Mountain
Wolf Creek-Two Mixes
Jefferson
(Chamberlain-Palisades)
Black Butte-Williams Mountain
Smith River
Mizpah
Roberts Creek
East Fork Spring Creek

Comments on the Snowies and Highwoods were mixed, with little response on the Highwoods. Comments on the Castles were also small. Comments on the Crazies were centered around the controversy over rights-of-way and was directed toward Warm Springs and Comb Creek. The comments were all negative and came from nearby landowners.

Commentators

Against timber harvest in certain areas: PW10, PW14, PW18, PW23, PW25, PW28, PW29, PW31, PW73, PW76, PW79, PW91, PW92, PW101, PW122, PW126, PW146, PW154, PW166, PW170, PW177, PW182, PW183, PW193, PW202, PW211, PW218, PW235, PW236, PW237, PW238, PW245, LT2, LT6, LT8, LT28, LT29, LT34, LT43, LT46, LT58, LT62, LT76, LT77, LT83, LT91, LT119, LT126, LT129, LT131, LT142, LT150, LT151, LT152, LT153, LT155, LT156, LT159, LT164, LT165, LT168, LT169, LT171, LT172, LT173, LT174, LT177, LT178, LT180, LT182, LT183, LT185, LT186, LT187, LT188, LT190, LT193, LT197, LT199, LT200, LT202, LT203, LT205, LT207, LT208, LT211, LT214, LT216, LT219, LT221, PT225, PT226, PT227, PT228, PT229, PT230, PT231, PT232, LT234, LT236, LT238, LT240, LT242, LT244, LT256, LT258, LT259, LT260, LT262, LT263, LT266, LT267, and LT273.

For timber harvest in certain areas: PW4, PW11, PW93, PW109, PW129, PW153, PW163, LT36, LT108, LT120, and LT243.

Response

Each area was reviewed by the planning and management teams to determine if timber harvest was an appropriate land use. On the Rocky Mountain Division, several changes were made in timber management areas in response to better defining management area boundaries and protecting other resource values. The timber harvest area was placed in a new Management Area 0, to emphasize a

small sales program. The overall sale program on the Rocky Mountain Division was reduced to 0.5 million board feet yearly. Permanent roads will not be constructed under this program. The Forest feels this program will meet local needs and protect other values. (Also see Economics in this section.)

On the Jefferson Division, the area in the Middle Fork Judith to be managed for timber management was reduced by about 12,600 acres. In response to the State and other public concern, the acreage reduction avoids any road construction that would link Kings Hill to the lower Middle Fork and protects elk calving areas. Hoover Creek, Oti Park, and Head of the Smith, were placed in unroaded management to maintain elk security habitat. Other important elk habitat in the South Fork Judith, Spring Creek, and East Little Belts was placed in a management area which provides elk hiding cover, but also allows for timber harvest (Management Area C). In the final Plan, the area in the Middle Fork Judith to be managed for timber management was also placed in Management Area C. Areas that have been logged in Chamberlain-Palisades and Logging Creek were placed in a management area which provides for a continuation of timber management practices (Management Area D). Rights-of-way are discussed under Lands in this section.

Concern-Clearcutting

Several reviewers commented about clearcutting. Some were against clearcutting altogether, while others wanted smaller clearcuts or wanted other harvest systems used.

Commentators

Against clearcutting: PW62, PW73, PW111, PW211, LT10, LT91, LT155, LT203, and LT204.

Wanted smaller clearcuts: PW79, PW80, PW81, and PW267.

Wanted shelterwood harvest: PW20, PW21, and PW76.

Response

Additional information on even-aged management has been added to the final EIS. Clearcutting is only used where it is the optimum silvicultural system. Optimum is considered to be the situation where no other silvicultural system is an alternative to clearcutting as a result of applying regional standards (see Northern Regional Guides). Clearcutting insures the perpetuation of certain tree species and permits orderly salvage in dead and dying areas. It often provides the only effective means of combating destructive forest enemies, such as

insects and disease. Clearcutting is a sound and practical way of bringing mature and overmature lodgepole pine forest under management. Appropriate silvicultural systems for the Lewis and Clark National Forest have been added to the Appendix A of the final Plan.

Concern-Firewood Cutting

A number of reviewers were concerned about firewood cutting. Most wanted to continue firewood cutting.

Commentators

Wanted firewood cutting continued or enhanced: PW12, PW43, PW70, PW84, PW88, PW110, PW141, PW171, PW218, LT31, LT107, LT115, LT127, LT188, LT239, and LT241.

Against firewood cutting: LT35.

Response

Additional information for the impacts of firewood cutting has been added to the final EIS. The Forest will continue to supply firewood for home and commercial use. Permits will be required for all firewood cutting as directed by National Policy. Free use will continue in designated areas of excessive deadwood, such as slash piles. Dead trees used by wildlife will be protected. Each timber sale will be evaluated to determine whether the roads should remain open until timber slash material has been removed for firewood.

MINERALS

Of the 436 comments on the DEIS and Proposed Forest Plan, 144 (33 percent) dealt with minerals management.

Concern-
Oil and Gas Exploration

Many commentators favored oil and gas exploration. Some of these reviewers qualified their approval with the need to enforce special stipulations and to protect wildlife, wilderness, and recreation values. Other commentators opposed oil and gas exploration because of the possible harm to wildlife, fish, soil, water quality, and wilderness values. Some of the reviewers were against exploration in the wilderness or other special areas.

Commentators

For Exploration: PW129, PW132, PW137, PW140, PW148, PW162, PW169, PW209, PW210, PW232, and LT267.

Against Exporation: PW13, PW115, PW121, PW128, PW180, PW183, PW211, LT11, LT45, LT60, LT70, LT76, LT83, LT126, LT149, LT165, LT166, LT169, LT186, LT234, and LT256.

Response

For the past five years, the Forest has had an active oil and gas exploration program. Most of the work has been done by the helicopter supported seismic method, on the Rocky Mountain District. No road construction is allowed for seismic exploration. The Forest Plan sets the standards that are the basis for specific clauses to be attached to seismic prospecting permits. (See Forest Plan, Management Standard G-1.) A monitoring/evaluation program has been established to determine the effects of those activities (see Appendix H, Forest Plan). The Bureau of Land Management, Fish and Wildlife Service, Montana Department of Fish, Wildlife, and Parks, and the Forest Service are cooperating in the evaluation program. This information is used to establish guidelines to aid land managers in their planning of human impacts along the Rocky Mountain Front (see Forest Plan, Appendix I).

Classified wilderness was withdrawn from mineral entry and leasing on January 1, 1984, and all lease applications have been rejected.

Concern-
Oil and Gas Development

Several commentators favored oil and gas development because of the petroleum shortage. Some reviewers include a word of caution for wildlife

and other values. One reviewer wanted good reclamation, while another wanted more dollars returned to the government. Many commentators were against oil and gas development because of the potential harm to wildlife, wilderness, roadless, and recreation values. Several commentators thought the little oil and gas that might be found was not worth the trade-off of wildland values. Some listed specific areas they did not want developed for oil and gas--the Deep Creek Further Planning Area was mentioned by several respondents.

Commentators

For Development: PW136, PW142, PW148, PW150, PW151, PW153, PW162, PW169, PW171, PW172, PW210, PW232, LT114, LT148, and LT188.

Against Development: PW144, PW146, PW152, PW154, PW163, PW166, PW177, PW180, PW181, PW183, PW202, PW211, PW212, PW214, LT6, LT11, LT47, LT59, LT68, LT130, LT131, LT138, LT170, LT173, LT180, LT188, LT234, LT242, LT256, and LT262.

Response

Based on previous environmental analyses, 423,373 acres of the Forest have been leased for oil and gas exploration and development or are recommended for leasing. Special stipulations have been used to protect surface resources. (See Chapter III.) The Forest has had three applications for a permit to drill. One request was to re-enter an existing shut-in gas well in Blackleaf Canyon. The re-entry of the well has been completed and it was found capable of production. Drilling on the other two sites (Hall Creek and Muddy Creek) has not yet begun. Forest-Wide Standards have been developed to insure oil and gas development is done in a manner which protects surface resources and is consistent with the multiple use concept. (See Forest Plan Management Standards, F-3, G-2, and L-4.) The Forest Plan does not pinpoint where individual oil and gas drilling projects will be allowed. Drilling requests will be handled on a individual basis, and will receive site-specific environmental analysis at the time of the request.

Concern-
Effect of Oil and Gas Activities on the Environment

Many commentators, while neither favoring nor opposing oil and gas activities, were concerned with the effects the activities have on the environment. Some commentators recommended a conservative approach to allowing these activities; other reviewers questioned the effects on archery

hunting, soil, water, and wilderness. One reviewer wanted more advanced warning of seismic activities. One reviewer questioned the effects of "sweeting plants." Four commentators questioned if the Forest Service could control oil and gas activities and access. Two commentators expressed a concern with roads for development. One reviewer recommended the roads be closed to public use, another felt there was less need for helicopter exploration, while another thought all exploration should be done by helicopter. One reviewer said the Forest Service should carefully consider the consequences of granting permits for exploratory drilling and such action would be a major Federal action requiring an EIS. Another reviewer wanted a system to share seismic information in order to prevent continual survey of an area.

Commentators

PW101, PW103, PW111, PW112, PW126, PW173, P176, PW177, PW179, PW182, PW182, PW214, LT38, LT50, LT51, LT54, LT57, LT63, LT64, LT66, LT67, LT73, LT74, LT142, LT199, LT202, LT204, LT214, LT215, LT219, LT221, and LT242.

Response

The Forest Plan details the standards and guidelines on how oil and gas activities are to be conducted - to minimize the effects of the activity on other Forest resources. Wildlife needs are prerequisite considerations in establishing guidelines and procedures for oil and gas exploration and development. The revised Plan includes guidelines developed by an interagency group, including the Montana Department of Fish, Wildlife, and Parks, the Bureau of Land Management, the Forest Service, and the Fish and Wildlife Service. Seismic activities could disrupt hunting opportunities; therefore seismic operations are not permitted during the general big-game hunting season to minimize the disturbance to wildlife. Seismic is managed to avoid recreation sites. Monitoring plots have been established and it has been found that seismic activities have little effect on soil and water resources. Seismic activities are not permitted in the Bob Marshall Wilderness Complex.

The authority to approve or deny certain lease activities rests with the BLM. As the surface managing agency, the Forest Service reviews projects and makes recommendations whether to approve or deny lease activities. Activities such as access are regulated by the Forest Service. Effects of sweetening plants, which remove H_2S

(hydrogen sulfide), are discussed in the DEIS-Supplement - Chapter IV, Minerals. Road use management standards and road densities have been established for each management area. (See Revised Forest Plan.) Most new roads constructed on the Rocky Mountain Division will be closed to public use.

The Forest Plan doesn't pinpoint where individual oil and gas drilling projects wil be allowed. Drilling requests will be handled on an individual basis, and will receive site-specific environmental analyses at the time of the request. The drilling permit process calls for the Forest Service to prepare an environmental analysis and to write a "biological evaluation". The biological evaluation considers the effects on threatened and endangered species. The U.S. Fish and Wildlife Service and the Forest Service consult to evaluate possible adverse effects under the Threatened and Endangered Species Act. Finally, the Forest Service makes a recommendation on the project, and the BLM either approves or denies the application. Should discoveries be made, a field development analysis will be conducted. This may take the form of an EIS or Environmental Assessment. An Activity Coordination Analysis is being prepared for the Blackleaf and Badger-Two Medicine areas that will address the effects of all activities.

Concern-
Hard Rock Mining

A few reviewers commented on hard rock mining. Three commentators expressed opposition to any mining. One commentator wanted mining kept to a minimum. One reviewer recognized the need to mine material for our needs. One commentator felt hard rock minerals should be addressed in the Forest Plan. One commentator felt the little operator could control environmental effects better than the big operator, and that improved mining technology will cause less impacts in the future. Another reviewer wanted more reclamation of old mines.

Commentators

PW31, PW180, PW204, PW220, LT3, LT10, and LT17.

Response

Hard rock mining and exploration is carried out under the authority of the 1872 General Mining Law, which entitles the miner to explore and develop mineral resources. The Forest Service controls these activities through its surface mining regulations. Under these regulations, miners must

submit a Notice of Intent to work on a claim. If the Forest Service decides that such an operation will cause a significant environmental disturbance the miner must submit a Plan of Operation, which must be approved and/or modified by the Forest Service. In compliance with the 1872 Mining Law, the approval of operations is contingent on the operator's ability to minimize adverse environmental impacts.

Concern-
Planning Process

Several commentators expressed a concern that energy and minerals did not receive adequate consideration during the planning process. They thought primary consideration was on mitigating oil and gas activities. The reviewers went on to say NFMA regulations require Forest Plans to consider:

(1) Active mines within the area of land covered by the Forest Plan.
(2) Outstanding or reserved mineral rights.
(3) The probable occurrence of various minerals, including locatable, leasable, and common variety.
(4) The potential for future mineral development and potential need for withdrawal of areas from development.
(5) Access requirements for mineral exploration and development.
(6) The probable effect of renewable resource prescriptions and management direction on mineral resources and activities, including exploration and development.

The commentators felt to comply with these regulations, the Forest Plan must:

(1) Provide for mineral resources on National Forest land.
(2) Identify lands having energy and mineral potential and take action to open and maintain access to these resources while meeting minimum legal standards for environmental standards.
(3) Identify when conflicting resource values outweigh potential mineral resource values and what minimum standards for protection must be applied to meet Plan objectives.

The commentator urged that the Forest re-evaluate the process and incorporate the changes into the Forest Plan.

Commentators

LT40, LT50, LT51, LT54, LT56, LT57, LT63, LT64, LT65, LT66, LT67, LT71, LT73, LT74, LT93, LT162, and LT255.

Response

Oil and gas activities played a integral role in the development of the Lewis and Clark Forest Plan. In response to public comment, the way oil and gas leases would be affected by the alternatives was displayed in Chapter II of the DEIS-Supplement.

Chapter III describes the current level of oil and gas and other mineral activity, as well as the potential for future development. Effects of mineral or other activities and their affect on minerals are discussed in Chapter IV. Additional information has been added to this chapter. The Analysis of the Management Situation for minerals, withdrawals, and access needs are discussed in the Forest Plan. Management area prescriptions set the direction for mineral resources along with the overall Forest-Wide Management Standards.

The Forest feels that with these changes it has been responsive to the requirements established by the NFMA regulations.

Concern-Exploration

Many of the same reviewers took issue with Forest Management Standards G-1 Seismic Exploration, G-2 Oil and Gas Leasing, Exploration Drilling, Field Development, and Production, and G-3 Rehabilitation. They felt the standards were not being properly applied and that it was a bad policy to assume only damage would occur from oil and gas activities. The restrictive stipulations would render leases inoperable. One reviewer felt the mitigation measure should be in the FEIS.

Commentators

LT47, LT50, LT51, LT54, LT56, LT57, LT63, LT64, LT65, LT66, LT67, LT71, LT73, LT74, LT75, LT93, LT148, and LT255.

Response

The Forest does not assume only damage will occur from oil and gas activities. These standards were prepared to allow for oil and gas activities, while protecting surface resource values. Exploration companies have completed over 700 miles of seismic lines using standards similar to G-1, Seismic Exploration. And, although exploration was or is sometimes delayed to protect wildlife, recreation, and other values, the companies have been able to complete their projects in a timely manner. All oil and gas lease applications in nonwilderness areas have been processed. Over 423,000 acres have

been leased. Only one lease has had exploratory drilling. To avoid unneeded duplication, the specific mitigation measures are listed as management standards in the Forest Plan.

Concern-
Positive Aspects

The preceding commentators asked that the Plan be modified to reflect the positive aspects of energy and mineral activity.

Commentators

See - Concern-Exploration.

Response

Several changes have been made in the DEIS-Supplement and Revised Proposed Forest Plan to reflect the more positive aspects of energy and mineral activity. Management Standards G-1 and G-2 have been updated to comply with the Environmental Assessment on Geophysical Exploration. Management Standard G-3, Rehabilitation, has been incorporated into D-3, Standards for Riparian Areas, Soil, and Water Protection.

Management Standard D-3 will provide direction for all activities that disturb the soil. Management Area L has been created to emphasize locatable mineral resources.

Concern-
Mineral Standards

A few reviewers commented on the proposed mineral standards in the Plan. Comments were: (1) there should be fewer standards which are specific to geographic units; (2) occupancy stipulations to protect wildlife should be more flexible; (3) road construction should be limited to slopes less than 40 percent; (4) the proposed standards for oil and gas activities are less stringent than the current policy; (5) mitigating conditions for mineral exploration would not satisfactorily protect wildlife habitat and ecological diversity on the Rocky Mountain Front; (6) the standards in the Proposed Forest Plan are not specific enough to make oil and gas exploration compatible with grizzly bears; (7) what is the definition of "adequate separation" as used on page 4-19 of the Proposed Forest Plan; and (8) where in the Plan is issuance of no-surface occupancy or lease denial if an area cannot be adequately protected. One reviewer questioned why have standards if you are not going to follow them and why a standard was left to the discretion of the District Ranger.

Commentators

LT38, LT165, LT236, LT241, and LT242.

Response

Based on information from the Interagency Wildlife Monitoring/Evaluation Program for the Rocky Mountain Front, the guideline which establishes activity levels to protect T&E species has been modified. The new guideline is more specific and wildlife biologists feel it will better meet the grizzly bears' needs. While roads on slopes between 40 and 60 percent require special measures to protect soil and water resources, the Forest has constructed roads on these slopes without any undue problems. Although there are some slight changes in the management standards for oil and gas activities, the standards are based on four years of experience (700 miles of seismic lines) and have been carefully reviewed by resource specialists and Forest managers. The Forest feels that adequate wildlife protection is provided by the standards. Issuance of no-surface occupancy and lease denial is discussed on page 2-57 of the final Forest Plan. Standards direct the management of Forest activities and resources.

Not every possible case can be anticipated and analyzed, so there has to be some discretion in their use. However, the Interagency Guideline was rewritten and approved in April, 1984. The guidelines are more specific and eliminated much of the need for discretionary use. "Adequate separation" has been replaced with a more specific term. (See final Forest Plan, page 2-53 and Appendix I.)

Concern-
Lease Stipulations

Three reviewers commented on lease stipulations. One commentator thought that past drilling activities on private surface leases adjacent to the Rocky Mountain Division indicates, "No-surface occupancy and seasonal time limits on surface occupancy may be unrealistic." One commentator questioned how the stipulations would constrain the oil and gas development. One commentator felt that access stipulations in the Big Snowies would preclude any effective mineral inventory. Another commentator was unhappy with no stipulations on some oil and gas leases.

Commentators

PW85, LT72, and LT93.

Response

There is a very distinct change in topography, landtype, and resource values between private and National Forest lands. Stipulations are based on the land's capability for development and protection of surface resource values. The Forest

Service feels that the stipulations provide the needed resource protection. No development has been done on any of the leases (except for the reopening of a shut-in well in Blackleaf Canyon). Table 3.4 in the DEIS-Supplement shows how the stipulations affect oil and gas development. In almost every instance, leases have some opportunity for surface occupancy. Timing and activity coordination stipulations would affect when activities could take place. Most of the Big Snowies is a wilderness study area. If the Big Snowies is classified as wilderness by Congress, it will be withdrawn from all forms of mineral entry and leasing. If the Big Snowies is not classified as wilderness, there will be opportunities for mineral entry and leasing. All leases have stipulations to protect surface resources. The geographic unit maps in the Forest Plan for the Rocky Mountain Division show areas of no-surface occupancy, limited surface use, and surface occupancy. The geographic unit map legend has been changed to reflect this.

Concern-
Mineral Demand

A few comments dealt with the demand and need for oil and gas and other minerals. One reviewer felt the Forest should monitor National energy needs. Two reviewers felt that the National need for oil and gas cannot be demonstrated for the Rocky Mountain Front. One reviewer felt the demand for minerals would increase. Another reviewer thought fossil energy, by its nature, was a short-term priority and should not be given such a high priority in the Proposed Forest Plan. One commentator felt the Rocky Mountain Front was not important for energy exploration because true petroleum in this area was low. They also expressed that the need for natural gas, as described on page 2-24 of DEIS, was not relevant. One commentator thought oil and gas gives little profit to the leasing agency.

Commentators

PW85, PW218, LT11, and LT154.

Response

Through RPA, the Forest Service makes a comprehensive National assessment of forest and rangeland resources every 10 years. With this assessment, the Forest uses other resource assessments, including those for National energy needs. Comparisons of this position of the overthrust belt with the Canadian and Utah-Wyoming portions indicates the National significance of possible hydrocarbon resources in

the Rocky Mountain Front. Because of the possible impact of energy exploration and development, the mineral evaluation has been given a high priority in the Forest Plan planning process. The need for natural gas, as described on page 2-24 of the DEIS, is an indication of demand. Leases on the Forest generated over $400,000 in 1985. This money was returned to the U.S. Treasury.

Concern-
Alternative Evaluation

A few reviewers commented on the alternative evaluation. One reviewer questioned why every alternative considered involves occupancy leasing of at least 63-73 percent of the Forest. Other commentators recommended the potential, as well as the degree of difficulty, for energy and mineral exploration and development be reflected for each alternative. One reviewer stated there was no mention of pipelines, sweetening plants, and roads. One reviewer stated there was little chance for oil and gas in the Snowies.

Commentators

PW41, PW213, LT190, and LT222.

Response

In response to this concern, the alternative comparison has been changed in the DEIS-Supplement to better portray the alternatives' effects on current oil and gas leases. In the DEIS, lands available for oil and gas occupancy leasing were displayed. These figures varied between 35 and 41 percent of the total Forest. Because over 423,000 acres have already been leased (59 percent with surface occupancy), this comparison has been deleted. Occupancy leasing was shown in all alternatives because the Forest believes it is compatible with the goals and objectives of the alternative and surface resource can be maintained. Gas sweetening plants, and pipelines, are now discussed in Chapter IV. Recent geological models indicate there is a potential for oil and gas in the south half of the Big Snowies.

Concern-
Management Activities

A few reviewers commented on oil and gas and other management activities. Two reviewers thought the timber management should not be separated from oil and gas development, which left the reviewer unsure as to which areas will remain roadless. The State of Montana questioned if the roads in the Plan gave final approval to their construction. Two commentators felt that oil and gas development would be all the Rocky Mountain District could withstand if the wildlife resource is to be maintained. Another

felt the Proposed Forest Plan did not illustrate how oil and gas activities and wildlife could be compatibly managed. Three commentators questioned if it was possible to control oil and gas road location so that the roads would serve other needs.

One reviewer felt it was unclear how conflicts between semi-primitive recreation and minerals would be resolved. The reviewer also questioned if riparian zone management would eliminate mineral exploration and development.

Commentators

PW193, PW197, LT161, LT162, LT188, and LT273.

Response

Areas scheduled for timber harvest will be roaded and developed over time. Areas leased for oil and gas exploration and development may or may not be roaded and developed. Oil and gas exploration is highly speculative. Activity seldom proceeds beyond preliminary exploration or exploratory drilling in any given leased area. The road design and exact location are part of the project planning for an activity and should not be addressed at the Forest Plan level of planning. (See Forest Plan pages 1-11.) Semi-primitive recreation management will not restrict minerals developed, but mineral leases in recreation areas will have more stipulations. (See Forest Plan--Management Areas F and G.) We feel the management standards for minerals will provide protection for wildlife and wildlife habitat, while still providing opportunities for oil and gas exploration and development. We feel this illustrates that oil and gas activities and wildlife are compatible. The on-going seismic exploration and leasing program further supports this compatibility.

A small timber harvest program, which is compatible with other resource values, is proposed for the Rocky Mountain Division. If roads are built for oil and gas exploration and development, the roads would provide an opportunity to manage the timber resource in areas allocated to timber management (Management Area O). The proposed transportation system will be designed to serve both needs.

Concern-
General Comments

There were a few general comments. Two commentators felt that the statement on page 4-68 of the Proposed Forest Plan, "Oil and gas values are usually unknown at the lease decision stage. When

this practice (GA3b - Surface Occupancy) is selected, it may be necessary to remove or modify surface protection stipulations through environmental analysis if an exploratory well demonstrates oil and gas values," dilutes the intent of the protective stipulations. One reviewer did not want minerals subsidized. One reviewer felt better access was needed for oil and gas development. One reviewer felt the State of Montana had a non-development policy for oil and gas with too many restrictions. One reviewer questioned the ability of the Forest Service to reclaim disturbed areas.

Commentators

PW136, PW155, LT112, and LT242.

Response

We agree with these reviewers and have deleted the statement on page 4-68 of the Proposed Forest Plan. The mineral guidelines established the degree of surface resource protection. Minerals are developed entirely by private enterprise. The Forest has completed the necessary transportation planning for possible oil and gas access needs. The Forest has had a very successful rehabilitation program for timber harvest and flood damage which reflects our ability to conduct successful rehabilitation on disturbed areas.

SOIL AND WATER

Of the 436 comments on the DEIS and Proposed Forest Plan, 83 commentators (19 percent) had a concern with soil and water management.

Concern-Erosion, Sediment, and Water Quality

Many commentators were concerned about erosion, sediment, water quality, and watershed protection. Some were concerned that the stated increases were an average over the Forest and some drainages might experience a much higher increase than others. Some expressed a desire to have estimates in the FEIS displayed by drainage rather than Forest-wide. Closely tied to concerns about erosion and sediment were concerns about water quality and watershed protection. Of greatest concern for all groups is the effects that timber harvest and grazing could have on water quality. The State of Montana pointed out the discussion of water on page 3-14 of the DEIS incorrectly states that water is a priced commodity and can be bid away from agricultural users by industrial and domestic users. They also felt suitability/non-suitability of timber harvest areas of the Rocky Mountain Division had not been scrutinized.

Commentators

Erosion: PW31, PW41, PW129, LT38, LT45, LT61, LT113, LT157, LT159, LT176, LT188, LT190, LT210, LT223, LT242, and LT273.

Sediment Increase: PW62, PW97, LT11, LT61, LT83, LT98, LT115, LT143, LT157, LT172, LT175, LT176, LT188, LT189, LT190, LT198, LT223, PT225, LT241, LT242, LT245, LT267, and LT273.

Water Quality: PW28, PW97, LT38, LT40, LT60, LT61, LT83, LT159, LT188, LT205, LT223, LT265, LT267, and LT273.

Watershed Protection: PW5, PW28, PW29, PW31, PW96, PW97, PW114, PW166, LT38, LT39, LT40, LT61, LT129, LT180, LT189, LT212, LT214, LT215, LT235, LT236, LT241, LT265, and LT273.

Water Quantity: LT61, LT223, and LT245.

Against Forest-wide sediment and water quality effects: PW44, LT11, LT113, LT115, LT188, LT223, and LT245.

More information on erosion, sediment, and water quality: LT189, LT210, LT223, LT241, LT242, LT245, and LT273.

Response

The Forest shares the concerns about erosion, sediment, and water quality and the effects of resource programs have been reanalyzed. The Forest Soils Resource Inventory was used in the Forest Plan to determine limitations and hazards for road construction and other project activity. Generally, the Plan calls for no roads on slopes with more than a 60 percent grade, no facilities on slopes with more than a 40 percent grade, and no tractor skidding for logging on slopes more than 45 percent grade. The Forest Plan calls for all reasonable conservation practices to prevent any new management-caused erosion. These "Best Management Practices" have been further defined in establishing Forest-Wide Standards for (1) range management (D-3); (2) timber harvest (E-4); (3) soil and water protection (F-3); (4) oil and gas activities (G-1 and G-2); (5) road maintenance and construction (L-4); and (6) debris control (P-2). For Management Areas J and R, specific protection measures are listed as standards for range, timber, and minerals. Despite implementation of these standards, management action is predicted to cause a one percent increase in sedimentation Forest-wide.

As an aspect of any project plan, site water quality effects will be evaluated and control measures instituted to ensure the project will meet Forest water quality goals. Projects that do not meet State water quality standards will either be redesigned, rescheduled, or denied.

In response to public concern, the Forest has calculated projected sediment yield for the major drainages where the most road construction and timber harvest will take place.

AVERAGE TON/YEAR INCREASE

DRAINAGE	ALT G FIRST DECADE	ALT G FIFTH DECADE	PERCENT INCREASE
Smith River-excluding Tenderfoot	1405	1464	4.2
Tenderfoot	2113	2106	-.3
Belt	3667	3673	.2
Lonetree	510	516	1.1
Dry Wolf	1621	1724	6.4
Middle Fork-Judith	2174	2240	3.0
South Fork-Judith	2008	2026	.9
Musselshell	1831	1949	6.4

Timber harvest and road construction uses the same landtype restriction as does oil and gas development. The statement on page 3-14 in the DEIS has been corrected.

Concern-Riparian and Wetlands

Many reviewers were concerned about activity in riparian zones and wetland areas and the need to protect these areas.

Again grazing and timber harvest were of greatest concern. The State questioned if specific funding allocations are made for these areas.

Commentators

For riparian protection: PW78, PW94, PW146, PW177, PW200, PW202, PW203, PW211, LT27, LT47, LT83, LT175, LT176, LT201, and LT233.

For riparian activity: LT150 and LT162.

Against riparian activity: PW101, LT38, LT43, LT44, LT46, LT210, LT239, and LT245.

Want riparian management adequately addressed: LT188 and LT210.

Response

In response to public concern, management area direction for riparian area has been changed. Riparian areas will be protected by minimizing project activity. Consultation with the Montana Department of Fish, Wildlife, and Parks and the Montana Water Quality Bureau is required. Standards have been established for stream crossings and for avoiding stream contamination. To protect or enhance unique ecosystem values, Management Area R, Riparian Zones, has been rewritten and gives preferential treatment to those resources dependent on riparian areas (water and wildlife habitat). The Forest-Wide Standards R-1, Riparian Zone Management, and W-1, Wetland Zone Management, have been expanded and incorporated into other management standards which deal with a particular activity. (See Forest Plan, Management Standards D-3, E-4, F-3, G-1, G-2, and L-4.) Management standards have been developed for riparian area protection in range and timber management. (Forest Plan Management Standards D-3 and E-4.) Riparian area prescriptions include the costs to manage these areas.

Concern-Sediment Effects

Several reviewers pointed out inconsistencies with the effects displayed for sediment in various places in the Plan and DEIS.

Commentators

PW44, PW133, LT11, LT38, LT113, LT157, LT238, LT245, and LT273.

Response	We agree, the sediment projections were inconsistent. Naturally-occurring sediment was not included in most places in the DEIS. The projected increase in sediment for each alternative was displayed. Projected percent of increase was calculated using both increases from 1981 to 2030, and increases above management causes from naturally-occurring sediment. This led to much confusion and inconsistency with sediment values. In the DEIS-Supplement, base (naturally-occurring) sediment is displayed along with projected increase by alternative. These values have been recalculated using the best available information. Percent of increase was calculated from the current situation with naturally-occurring sediment.

LANDS

Of the 436 comments on the DEIS and Proposed Forest Plan, 36 (8 percent) dealt with lands, including land exchange and rights-of-way acquisition.

Concern- Land Exchange

Several commentators favored land exchanges to improve Forest management. Two commentators were willing to trade land in the Crazy Mountains, but thought that not enough National Forest lands were offered for exchange. The State of Montana supported the acquisition of private land along the Forest boundary in the Loco Mountain Geographic Unit and opposed the disposal of lands along the Forest boundary in the Forest Lake Geographic Unit. (Both in the Crazy Mountains.) Another reviewer was disappointed that their lands were not included in the adjustment plan. Several commentators were opposed to land exchanges. Some landowners stated they would not sell or trade with the Forest Service. Two reviewers did not want any National Forest land sold. One reviewer opposed allowing any out-of-state group the opportunity to trade land, when the local people would welcome the chance. Three commentators were concerned with specific land exchanges.

Commentators

PW6, PW36, PW38, PW40, PW47, PW64, PW65, PW67, PW69, PW112, PW128, PW136, PW166, PW203, LT4, LT20, LT58, LT100, LT188, LT201, LT222, PT224, and LT273.

Response

The Forest Service is continually seeking ways to improve forest management. One way is to consolidate existing ownership, which is usually accomplished through land exchange. Land exchanges are made on a value basis. Appendix B of the Forest Plan identifies land exchange needs to support the preferred alternative. Some adjustments in the revised Plan have been made, including the State's recommendations in the Crazy Mountains. The Small Tracts Act (Public Law 97-465) allows the sale of: (1) mining claim remnants; (2) parcels of 10 acres or less innocently occupied by private parties because of an erroneous survey or land description; and (3) road rights-of-way no longer needed by the government. The Forest Service is also examining lands that the government no longer needs or could not manage efficiently. About 79,100 acres have been identified on the Forest for further study. However, the Forest Service does not have the authority to sell these lands. The Department of Agriculture plans to propose legislation to permit the sale of land that may ultimately be found suitable for disposal.

Concern-
Public Access

Several reviewers favored acquiring rights-of-way to improve access to National Forest lands. Some mentioned specific rights-of-way needs, such as trail access into Deep Creek and road access into Two Medicine and the Little Snowies. Several commentators were opposed rights-of-way across their land. However, some landowners said they would grant temporary access to remove timber.

Commentators

PW37, PW39, PW45, PW48, PW51, PW55, PW161, LT15, LT16, LT58, LT145, LT201, and LT217.

Response

Permanent rights-of-ways are acquired by the Forest Service as a means of providing long-term road or trail access to the Forest. Public and Forest Service access is needed for recreation and administration, respectively. Where access needs are determined to be short-term, temporary agreements could be made. Appendix C of the Forest Plan identifies rights-of-ways needed to support the Preferred Alternative (G). Some identified rights-of-ways may not be needed if subsequent project level planning reveals that private land could be avoided. And conversely, rights-of-ways not identified may be required. The Forest Service hopes to pursue rights-of-ways on a willing granter basis. Where access across non-Federal land is necessary and advantageous to the Government, every reasonable effort will be made to obtain a satisfactory easement on equitable terms through negotiation. If such a right-of-way cannot be obtained, condemnation will be recommended.

Concern-
Utility Corridors

Two commentators stated the need to provide for transmission corridors in the Forest Plan.

Commentators

PW189 and LT154.

Response

We agree, provisions for transmission corridors have been included in the Revised Proposed Forest Plan.

FACILITIES

Of the 436 comments on the DEIS and Proposed Forest Plan, 201 (46 percent) were concerned with facilities management, mostly concerning roads. The greatest concern was how would roads affect other resources.

Concern- Road Construction

Several commentators felt that roads were detrimental to certain resources, especially wildlife and water quality. A few commentators supported new road construction.

Commentators

PW97, PW98, PW152, PW181, PW230, PW232, LT4, LT6, LT46, LT48, LT83, LT114, LT115, LT123, LT125, LT143, LT159, LT163, LT175, LT200, LT201, LT210, LT236, and LT241.

Response

Transportation planning is primarily a support function for management of the resources of the Lewis and Clark National Forest. Road corridor location and management decisions reflect the road access necessary to manage the various resources of the Forest. In developing the Forest Plan, the first step in transportation planning was to determine where possible road corridors could be located to access the total Forest lands. Next, cost considerations were studied and evaluated to identify unfeasible, uneconomical, or resource incompatability problems with these road corridors. Finally, resource decisions were made on the landbase (where timber would be harvested, or where wildlife would be protected) to determine an areas future need for access. The total "mix" thus became the recommendation(s) of the Lewis and Clark National Forest Plan. These decision have been carefully reviewed by the planning and management teams.

Road construction is one of the many significant impacts on the Forest caused by access needs for the management of the Forest's resources. (See Chapter IV.) A road management program will be used to minimize the adverse changes from increased access. Seasonal or year around restrictions will maintain security habitat for wildlife that is intolerant of human disturbance. Proper road location, design standards, and construction and installation of drainage structures will aid in mitigating the impact of road construction on water quality. Management Standard L-4, Maintenance and Construction of Roads and Related Facilities, has been developed to minimize the impact of roads on other resources. The overall mileage of road construction has been reduced slightly under the new Preferred Alternative (G).

Concern- Road Management	Many commentators were concerned about when roads are closed and how the closures are enforced. Some reviewers wanted closures enforced, while others noted that closures were hard to enforce. Some commentators thought a road closure was obliteration or revegetation of the road. Many comments dealt with specific areas, rather than Forest-wide closures.
Commentators	Close Roads: PW8, PW25, PW31, PW64, PW177, and PW202. Seasonal Closures: LT241. Close Roads After Use: PW12, PW64, PW67, PW71, PW76, PW129, LT81, LT90, LT93, and LT204. Close Roads During Timber Harvest: LT93. Close Roads After Timber Harvest: PW2, PW6, PW11, PW13, PW18, PW25, PW27, PW34, PW62, PW63, PW114, PW121, PW177, PW200, PW232, LT81, LT146, and LT150. Close Roads During Hunting: PW64, PW218, and LT4. Close Roads After Hunting: PW113. Close Unmaintained Roads: LT241. Enforce Closures: PW6, PW10, PW14, and PW55. Hard to Enforce Closures: PW12, PW13, PW20, PW21, PW23, PW177, PW180, PW203, LT163, and LT201.
Response	Roads and trails are managed to provide public access, commensurate with promoting public safety, protecting resources, and minimizing environmental and user conflicts. (See Forest Plan, Management Standard L-2, Travel Planning.) Open road density (the miles of road kept open for public access) was among the major issues in the development of the Plan. Because of this concern, open road densities for each management area has been added to the Forest Plan. Recommended density of open roads in the Lewis and Clark National Forest is based on the Elk-Logging Study, which includes wildlife's need for thermal cover, feeding areas, and security.

As part of the Travel Planning process each road is reviewed by resource specialists and potential conflicts have been identified. If yearlong closures or seasonal restrictions are appropriate, recommendations are made to the District Ranger. These are reviewed by cooperating agencies and interested publics. The District Ranger then makes his recommendation to the Forest Supervisor. Again, each proposed closure or restriction is reviewed by the Supervisor and his staff to ensure conformance with the management objectives in the Forest Plan. The ability to enforce closures is an important consideration of each closure. The location of the closure is carefully evaluated to ensure the most feasible enforcement location. Temporary roads are obliterated and revegetated. Permanent roads, if closed to public motorized traffic, will be maintained in a manner necessary to protect the investment and prevent soil erosion.

Concern-
New Roads in Specific Areas

Many commentators were concerned about new road construction. Several comments were about specific locations.

Commentators

For New Roads in:

Pike Creek: PW146.

Little Belts: LT80.

Middle Fork Judith: LT243.

Snowies: LT80.

Against New Roads in Riparian Zones: LT44 and LT83.

Oil and Gas: PW101, PW128, PW142, PW177, PW183, and PW214.

Rocky Mountain District	PW91, LT121, LT130, LT134, LT142, LT149, LT151, LT152, LT169, LT171, LT173, LT174, LT178, LT179, LT180, LT185, LT186, LT197, LT199, LT202, LT211, LT216, LT218, LT219, LT221, LT235, LT256, LT257, LT262, LT263, LT270, and LT274. Spruce Creek: LT188. Fairview: LT188. Waldron Creek: LT188. Mill Falls: LT188, LT218, and LT235. Elk Creek-Falls Creek: LT218 and LT235. Petty Creek: PW126 and LT37. Badger-Two Medicine: PW176, LT38, LT236, and LT273. Lubec-Heart Butte: LT2 and LT273. Birch Creek: LT2 and LT273. Blackleaf-Dupuyer: LT2. Sun Canyon: LT273. Benchmark-Willow: LT273. West Fork Teton: LT159. Wood Creek: PW146.
Jefferson Division	PW40. Little Belts: LT80 and LT180. Middle Fork Judith: PW16, PW17, PW20, PW21, PW64, LT188, and LT211.

	Hoover-Oti Park: LT188. Rugby Creek: LT188. Tillinghast: LT188. Lucy Park: PT227. Placer Creek: PW10. East Fork Spring Creek: PT226. Taylor Hills: LT188. Rafferty: LT188. Pilgrim Creek: LT6. Snowies: LT80.
Response	Roads are constructed to provide access so that resource management objectives can be met. Roads also provide public access for pleasure driving, firewood gathering, berrypicking, and other recreational activities. Future road construction will be based on an Area Transportation Plan Analysis which analyzes the total transportation needs of each resource management area based on the management direction in the Forest Plan. Each management area was reviewed to ensure the management direction for road construction was commensurate with the capability of the land.
Concern-ORV's	Some commentators were concerned about trails for ORVs (off-road vehicles), especially snowmobiles. Some wanted all trails marked, groomed, and opened to ORVs.
Commentators	PW76, PW43, LT115, LT203, and LT204.

Response

Off-road vehicle use will be managed to protect the resources, to promote public safety, and to minimize user conflicts. (See Forest Plan, Management Standard L-2, Travel Planning.)

Separate winter trails have been provided for both motorized and non-motorized use. (See Forest Plan Management Standard A-5, Winter Dispersed Recreation Opportunity.)

Concern-
Number of Roads

Many commentators were concerned with the number of roads or the amount of access. Some said there were too many roads, while others said there were too few. Some reviewers were concerned about access throughout private land. Opposition dealt only with particular areas in the Crazy or Castle Mountains.

Commentators

Favor Access Through Private Land: PW2, PW38, PW64, PW66, PW157, and LT203.

Against Access Through Private Land:

Warm Springs: PW34, PW36, PW66, LT14, LT15, LT58, LT145, and LT217.

Comb Creek: PW34, PW37, PW47, and PW51.

Bozeman Creek: PW35 and PW36.

Too Many Roads or Access: PW59, PW64, PW80, and LT29.

More Roads or Access: PW43, PW64, PW110, PW134, PW135, PW161, PW164, PW173, PW232, LT31, LT184, and LT204.

Keep Roads to a Minimum: PW28, PW205, LT43, LT81, and LT196.

Response

The Forest is committed to minimizing the miles of roads and the design standards, while still providing for safety and user and resource needs. This requires that logging system design, timber sale design, and transportation planning be emphasized on all timber sales. Access for the proper protection, administration, and utilization of the National Forest also plays an important part in this process. Each access will be carefully considered and reviewed during the future planning process. (Also see Lands in this section.)

PROTECTION

Of the 436 comments on the DEIS and Proposed Forest Plan, 41 (10 percent) dealt with protection of Forest resources--fire protection and management and reducing timber losses from insects and disease.

Concern-
Mountain Pine Beetle

Several commentators recommended a higher level of timber harvest on available land, to prevent losses to insects and disease. Most commentators wanted the timber harvest increased to the RPA level of 41 million board feet. They expressed a concern with the potential loss of lodgepole pine to a mountain pine beetle epidemic. They pointed to mountain pine beetle infestations on the Gallatin and Targee National Forests. They thought the increased harvest was "prudent forest management" and of "basic economics" and sited the loss of revenue to the U.S. Treasury if such an epidemic developed. The State of Montana submitted that carefully planned harvesting is preferable environmentally to massive bug-kill and possible wildfire. But they also felt that if insect and disease problems would occur on the Rocky Mountain Division they would unlikely be restrained by timber harvest. One reviewer recommended a shorter rotation age for lodgepole pine. One reviewer pointed out the loss to wildlife if there was a mountain pine beetle epidemic.

Commentators

LT86, LT88, LT89, LT95, LT133, LT140, LT144, LT146, LT150, LT239, LT243, and LT273.

Response

The Forest shares the concern of a possible mountain pine beetle epidemic. The Forest Plan for the Lewis and Clark National Forest seeks to reduce the risk of mountain pine beetle outbreaks by scheduling at least 70 percent of the timber harvest during the next 20 years in lodgepole pine type timber stands. This practice will break up 200,000 acres of high risk lodgepole pine types of timber, reducing the risk of mountain pine beetle outbreaks. The Forest has reviewed this strategy in the field with Regional personnel in timber management and insect and disease control. Population levels of mountain pine beetles will be closely monitored to ensure that this strategy is effective.

Of the 189,000 acres of high risk lodgepole pine in the Jefferson Division, 137,000 acres are in management areas with a regulated timber program (Management Areas A, B, or C). Another 5,400 acres are in the Tenderfoot Experimental Forest (Management Area K), and 6,600 acres are in developed recreation areas (Management Area H). About 40,000 acres or 21 percent of the high risk lodgepole are in areas not managed for timber.

The rotation age for lodgepole pine has been shortened from 105 to 95 years. A mountain pine beetle epidemic would adversely affect many wildlife species. However, there are many species that would also benefit from such an attack.

Concern-
Use of Timber Harvest

A few reviewers recommended using timber harvest to prevent losses to insects and diseases. Four commentators specifically mentioned the Big Snowies. Other areas listed were Logging Creek, Cyanide Creek, and Middle Fork Judith.

Commentators

PW55, PW70, PW109, PW173, LT150, LT184, LT239, and LT243.

Response

In some areas, the management objectives, based on resource values, costs, and benefits, preclude regulated timber harvest. In these areas, insect and disease are allowed to play a more natural role. Such is true in most of the Big Snowies and Middle Fork Judith.

Concern-
Insect and Disease

A few commentators address insect and disease in a general way. One reviewer did not want the Forest clearcut, except if badly diseased. Another reviewer wanted the Forest logged only if there is a mountain pine beetle or spruce bark beetle epidemic. One commentator stated that if timber harvest emphasized the removal of stands that exhibit characteristics of high risk for mountain pine beetle attack, all old lodgepole pine stands over 90 years could be cut.

Commentators

PW203, LT103, LT203, and LT243.

Response

Insect and disease control is an important consideration of the silvicultural prescription prepared for each timber stand prior to harvest. Management strategies are developed to lessen timber losses and reduce the susceptibility of future stands. All old lodgepole pine stands could be harvested over the planning horizon (150 years). However, this harvest is scheduled only on 282,307 suitable acres of which 137,000 are high risk lodgepole pine.

Concern-
Fire Management

Several commentators expressed a concern with fire management. Four commentators stated their approval of prescribed burning. One reviewer thought forest fires should be allowed to burn in certain areas. While another reviewer thought fires in wilderness should be suppressed as there was no guarantee fire would stay within the wilderness.

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One reviewer thought there should be more information on fire and fuel management. One reviewer expressed a concern that trees do not grow where slash piles were burned. One commentator was opposed to the Forest Service policy of not letting the public fight forest fires. The State of Montana felt that little mention was made of fire management policies and cooperative programs with other agencies.

Commentators

PW6, PW25, PW78, PW114, PW115, PW118, PW174, PW224, LT81, LT150, LT203, LT204, and LT273.

Response

The Forest Plan provides the framework for a fire management program based on the concept of the lowest possible cost. The most cost-efficient program - control, containment, confinement, or any combination of the preceding - that meets management needs is identified for each management area and summarized in Appendix P. The Fire Management Action Plan used on the Forest contains decision criteria for selecting the most appropriate fire control program for each management area - wilderness and nonwilderness. This plan also provides for a substantial increase in the use of "prescribed fire" - in support of wildlife, range, and timber activities.

Prescribed fire is used under very controlled conditions. It is a very important tool in improving forage and wildlife habitat, and is sometimes used to control tree stocking. Fires allowed to burn under a prescription in wilderness and other areas are carefully monitored to see that they meet specific standards. One standard is that the fire remain entirely within the wilderness or fire management boundary. Additional information has been added on fuels and fire management in Chapter III.

In some instances, slash piles burn so hot that the mineral soil becomes sterilized and cannot provide the necessary nutrients to promote regeneration. Over time, the nutrients return and eventually seedlings become established. This is not considered a significant problem, because of the small area involved, and over time the area does regenerate. Fighting forest fire can be very hazardous requiring some skill and knowledge of fire behavior. The Forest can not risk personal injury or death, and therefore uses only trained and qualified personnel to fight fire. Difference in fire management by alternative is discussed in Chapter II. In response to the States concern, cooperative programs have been added to the discussion on Fire Management in the DEIS-Supplement and Revised Plan.

ECONOMICS

Of the 436 comments on the DEIS and Proposed Forest Plan, 123 (28 percent) had a concern with economics.

Concern-Less Timber

Numerous commentators indicated the Forest Service should not subsidize the timber industry. They were opposed to deficit timber sales and stated that a timber sale should pay for sale preparation, road construction, slash disposal, regeneration, and site preparation. The reviewers felt climate, soils, and slopes on the Forest are not conducive to profitable timber production. The economic return on timber is less than the loss in recreation, fish, and wildlife. The commentators stated offering more timber for sale does not create community stability, as no logging town is stable. And, that increasing timber outputs does not make sense because over the last three years the demand for timber has decreased. One person questioned how the closing of the mill at White Sulphur Springs could significantly reduce population when the majority of employment is in farming and ranching.

Commentators

PW6, PW14, PW34, PW63, PW87, PW92, PW152, PW200, PW235, PW246, LT3, LT10, LT76, LT81, LT112, LT114, LT122, LT125, LT131, LT138, LT139, LT142, LT145, LT149, LT151, LT152, LT161, LT165, LT169, LT171, LT173, LT174, LT180, LT185, LT186, LT197, LT199, LT202, LT208, LT209, LT211, LT212, LT214, LT216, LT218, LT221, PT224, LT233, LT236, LT241, LT244, LT245, LT246, LT247, LT248, LT249, LT250, LT251, LT252, LT253, LT254, LT256, LT257, LT259, LT262, LT263, and LT266.

Response

There is considerable misunderstanding about deficit timber sales. Timber is appraised by the Forest Service before it is sold. The appraisal system is:

Selling Value of Products Which Are Manufactured From the Timber

minus

Logging and Road Construction Costs

minus

Manufacturing Costs

equals

Stumpage Value (Appraised Value)

Selling values are determined from mill studies done in the Northern Region by the Forest Service. By law, all sales must be sold at or above base rates. Currently, the base rate is $1/MMBF for lodgepole pine and $6/MMBF for Douglas fir. If the stumpage is less than the base rate, a sale appraises deficit. The minimum bid price for a timber sale is either the appraised value or the base rate, whichever is greater. A timber sale could be bid up from the minimum bid price.

Although many timber communities are subject to a changing market, offering a steady timber supply will help community stability. Knowing that a steady supply of timber will be available allows an operator to make long-term investments, which can be capitalized against future harvest. Even though the quantity demanded for timber may be down right now, the demand curve for timber has been shifting outward since the 1960s. The short-term quantity demanded for timber may fluctuate but the net result has been a slow increase in demand. Over the last 5 years, the Forest has sold about 95 percent of its timber sale program.

Although the major employment of Meagher County is farming and ranching, the lumber mill supplied 150 jobs, or 7 percent of the population. The DEIS showed if the mill went out of business the unemployment rate would increase 2-1/2 times and the population could decrease by 375 people, or 17 percent. We consider a 17 percent decrease in population significant. We are just starting to see the effect of the liquidation of the Castle Mill which occurred in 1983.

Concern-
Timber Harvesting--
Rocky Mountain
Division

The economics of timber harvesting on the Rocky Mountain Division received considerable comment. Reviewers stated that timber on the Rocky Mountain Division is marginal and that the Forest should go elsewhere to harvest the small amount of timber programmed from the Division. Monies could be invested to intensify silvicultural practices on better sites elsewhere on the Forest. Timber harvesting would cause too much conflict with wildlife and recreation resources, and oil and gas development will be all that the Division can withstand. The commentators stated that no local communities are dependent on the timber, and the present economy is based on unique recreation and wildlife

resources. The State felt that Section 6(k) of the NFMA appears to require that marginal lands be classified as unsuitable for timber harvest, such as in the Rocky Mountain Division and that the PNV of timber harvest in the Rocky Mountain Division over the 50-year planning period is apparently negative.

Commentators

PW101, PW193, LT62, LT76, LT159, LT161, LT179, LT180, LT186, LT192, LT211, LT214, LT221, LT240, LT242, LT256, LT263, LT266, and LT273.

Response

Economically, it is less desirable to harvest timber on the Rocky Mountain Division than the Jefferson Division due to the cost of road construction and greater haul distances. However, on the Rocky Mountain Division there is a local need for wood products. PNV of harvesting timber in the Rocky Mountain Division is a positive value. Section 6(k) of the NFMA requires the Forest Service to identify lands not suitable for timber production. Economics is one of the factors used to evaluate the suitability of lands for timber management. Our analysis shows 58,000 acres in the Rocky Mountain Division are tentatively suitable for timber production. About 8,000 acres (14 percent) of these acres are included in the timber base as suitable for timber production.

In response to public concern, the harvest on the Rocky Mountain Division has been reduced to 0.5 million board feet (including sawlogs, houselogs, posts, poles, and firewood). The Forest feels this program will meet local needs and protect other values. Monies have been programmed to precommercial thin stands that stagnate on the Jefferson Division. Additional investment in intensive timber management practices is not cost-efficient.

Concern-
More Timber

Some commentators felt timber harvesting should be increased, to create jobs, support communities, stimulate the economy, increase PNV, and fulfill the demand for timber.

Two reviewers calculated the loss to the U.S. Treasury if the lodgepole pine was not harvested and lost to the mountain pine beetle. A few commentators believed areas that are managed for semi-primitive recreation could be developed economically for timber. Because private supplies are decreasing, one group believes the demand for timber from the Forest was underestimated.

They felt lands in the Rocky Mountain Division should be kept in the timber base, in case the economics of that area changed. They also wanted timber sales made more economically viable.

One reviewer commented that the costs for planting, brush disposal, and precommercial thinning were too high and would affect the economic analysis of timber.

Commentators

PW55, PW155, LT80, LT89, LT104, LT105, LT120, LT127, LT140, LT141, LT144, LT146, LT150, LT181, LT239, LT243, and LT273.

Response

The timber harvest level increases to 20 million board feet by the third decade under the Preferred Alternative (G) for many of the reasons cited in this comment. The Forest will accelerate harvesting lodgepole pine and defer cutting Douglas fir until later decades, to help mitigate potential losses from the mountain pine beetle. The Forest feels that many of the areas managed for semi-primitive recreation would be too costly to access and would be better managed for other values. The demand for timber from the Forest has been reanalyzed. (See Timber, this chapter.) With private timber supplies decreasing, there is some question whether the level of timber offered by the Forest is enough to help sustain the existing mills. This situation will be monitored closely.

As for lands on the Rocky Mountain Division, about 13 percent of the available commercial forest lands have been kept in the timber base (8,000 acres out of 58,000 acres). The other acres were removed to protect other resource values.

Future timber sales are being made more economically viable through changes in sale layout and design, road construction modifications, and management efficiencies. Timber sales since 1982 reflected this effort.

The costs of planting, brush disposal, and precommercial thinning were reviewed and changed slightly. These costs are based on the Forest's historical costs of accomplishing these projects and taken into account methods to reduce costs in the future.

Concern- Recreation Benefits	Some reviewers commented that benefits for recreation were miscalculated, and that the value for the hunting RVD, at $21.00 per RVD, was too low and not in line with what private firms were charging. They felt all the costs should be accounted for in hunting wildlife (food, gas, rifles, and cameras). Some commentators thought that increasing wildlife and hunting opportunities would increase income to many businesses and communities (including out-of-state money from tourism and hunting). One reviewer felt downhill ski revenues should have been given more consideration because these revenues contribute to the cash income of local areas. A few commentators felt the value of keeping recreation opportunities in a semi-primitive setting exceeded the value from timber harvesting and a roaded setting. One reviewer wanted the economic return on grizzly bears calculated (revenue from tourism, photography, and sale of hides).
Commentators	PW24, PW75, PW62, PW154, LT11, LT32, LT38, LT44, LT172, LT190, LT223, LT238, and LT241.
Response	Recreation values were reviewed in response to public comment. The value for the hunting RVD represents a "willingness to pay" value. A "willingness to pay" value is a surrogate market value. In contrast, the value of timber can be determined on the open market, and the values for range can be computed based on the economic value to the permittee under current conditions, considering such things as livestock market prices, and productivity of livestock using the Forest. These values do not include additional costs for getting to the range or timber (such as food, gas, and machinery), but include only the cost the user is willing to pay for the consumption of the resource. Therefore, it would not be correct to include additional costs in the calculation of hunter RVDs. In one private hunting area near the Forest, hunters pay $50 per day to hunt deer. This value does reflect a "willingness to pay" value. However, the private hunting area is only one example of what could be charged on the open market and constitutes a different experience. For example, success ratio might be significantly higher on private hunting areas than on public lands. Some people would be willing to pay more for that experience.

The economic value of hunting and downhill skiing is recognized as being very important to many businesses and communities. The Preferred Alternative (G) maintains the current downhill skiing opportunity, habitat for the existing elk herd, and 92 percent of the inventoried roadless areas.

Some areas previously allocated to timber in Alternative F have been changed to a semi-primitive recreation or wildlife emphasis in recognition of non-timber values identified by public comments and the Interdisciplinary team evaluation (Oti Park, Hoover Springs, and Head of the Smith).

The economic return from user activities related to grizzly bears is not known. It is believed to be minor on this Forest. No known research exists on such an economic return from grizzly bears. Values will not be calculated for this planning effort.

Concern-
Range Management

Several commentators were concerned about the economics of range management. They felt the value per AUM was too high. Other commentators questioned how fencing and weed control were paid for and whether the permittees shared in these costs. Some reviewers commented that range permittees pay very little for the forage. Grazing should pay its own way. Some commentators felt that grazing results in a net loss to most everyone except the rancher, and that the low rates for grazing encouraged exploitation of the range resource, which would affect the wildlife resource (specifically hunting opportunity and revenues). Some reviewers wanted the Forest Service to determine a good economical balance between range and wildlife.

Commentators

PW25, PW49, LT44, LT45, LT115, LT157, LT188, LT223, and LT241.

Response

Range values were reviewed in response to public comment. The value for range was developed by the USDA-Economics Research Service. The value of any unit of forage is measured by the maximum amount of dollars which the consumer would be willing to pay for that unit. For the Lewis and Clark Forest, that value is $11.69 per AUM. It appears to be commensurate with what is being charged for grazing on private land.

Fencing, water developments, and other structural range improvements are generally cost shared between the Forest Service and range permittees.

In some cases, the Forest Service pays 100 percent of the cost, such as is the case that involves protecting wildlife habitat. Grazing fees are determined based on a formula specified by the U.S. Congress. The Forest Service does not and cannot establish the grazing fee, but rather collects a fee which is determined through a formula deemed appropriate by Congress. Weed control is shared with counties, and in some instances with the grazing permittee.

Although grazing fees may seem low, exploitation of the range resource should not occur. Amount of use, period of use, number of AUMs, and management practices are specified in allotment management plans. Inspections are made to insure compliance. Change in allotment management must go through the environmental analysis process. If any environmental degradation occurs, the allotment could be reduced or cancelled.

Striking a good economical balance between range and wildlife is difficult to do because the benefits from wildlife are hard to measure. The most efficient allocation of these two resources depends on how much benefit the public perceives from the two resources. This can be expressed through public comment.

Concern-
Timber Suitability

The definition of timber suitability was raised by three reviewers. They wanted to see an economic suitability analysis done according to 36 CFR 219.14(b). A sensitivity analysis on timber prices was also requested.

Commentators

LT190, LT223, and LT241.

Response

An economic timber analysis has been done for the Forest. It involved using Objective Function 9 in FORPLAN. This analysis only included the direct costs and benefits of growing and harvesting timber. Non-timber costs were deleted. This analysis displays the PNV of the existing stands and regenerated stands as well as the PNV of the stand starting from bare ground and managed for an infinite series of rotations. The latter PNV is termed soil expectation value. These calculations were done for two different price structures, existing prices and prices at 2030 with real price increases.

NOTE: These increases are not inflationary increases but rather reflect the fact that the price of lumber has been increasing relative to the general price level.*

As expected, areas with steep slopes, low productivity, and long haul distances often had negative soil expectation values. Other areas had zero or low positive values. The soil expectation value is also sensitive as to which price structure is used. Objective Function 9 is available for review in the Supervisor's Office, Lewis and Clark National Forest.

If the soil expectation value is negative, it can be argued that these lands are not economically efficient for timber production, i.e. the return on an investment for growing timber returns something less than the discount rate (in this analysis, 4 percent). However, these lands should not be classified as unsuitable for timber production. In 36 CFR 219.14(c)(3), it is stated that lands shall be identified as not appropriate for timber production if, "the lands are not cost-efficient, over the planning horizon, in meeting forest objectives, which include timber production." Although land may not be economically efficient for timber production, timber production may be the most cost-effective means of meeting other Forest objectives. For example, if the objective of an area was to create habitat diversity, increase forage, and provide timber products, the most cost-efficient way to achieve these objectives may be through timber harvesting. Satisfying the objectives of creating habitat diversity and increasing forage may indicate harvesting on lands that are not economically efficient for timber production alone. A sensitivity analysis was not done because the Forest has continued to sell all of its timber sale program at prices slightly less than projected.

Concern-
Forest's Budget and Monitoring Costs

Seven reviewers commented on the Forest's budget and monitoring costs. One commentator felt the budget was unnecessarily constrained to meet existing budget recommendations. Two reviewers felt actual monitoring costs would exceed those indicated in the Plan. Commentators questioned if budget reductions occurred, would the Forest still

* Adams, D.A. and R. Haynes, The 1980 Softwood Timber Assessment Market Model: Structure, Projections, and Policy Simulations, Forest Science, Monograph 22,

be held accountable for outputs. They wanted to know if the reductions would mainly affect monitoring and maintenance areas, and why no description of budget for surface protection and regulation was given. A few reviewers questioned why returns to the U.S. Treasury were so much less than the budget.

Commentators

PW97, PW106, LT188, LT190, LT193, and LT243.

Response

The budget was constrained only slightly, or not at all, in each of the alternatives. No attempt was made to meet existing budget recommendations. If budget reduction did occur, outputs would be adjusted. Budget reductions would affect all activities, not just monitoring and maintenance. The actual monitoring costs in the budget are based on the historical cost of monitoring. Only the additional costs were shown. Because of the confusion, costs have been dropped from the Monitoring and Evaluation Plan.

Returns to the Treasury are lower than the budget for a variety of reasons. Recreation and range, which users pay below market prices for or not at all, return little money to the U.S. Treasury. Wilderness, wildlife, and water do not directly return any money to the Treasury. With a relatively small timber program, the Forest returns little to the Treasury compared to the Forest's budget. In the future, more dollars may be returned to the Treasury from oil and gas leasing and royalties. The intent of the Preferred Alternative (G) is to maximize benefits to the public, not returns to the U.S. Treasury.

Concern-
Oil and Gas Leasing and Development

A few reviewers commented on the economics of oil and gas leasing and development. One commentator felt the Forest Service was subsidizing the oil and gas industry by charging so little for oil and gas leases. Another commentator felt the true costs of boom-bust development associated with oil and gas activities were not reported (e.g., cost of sewers, schools, and additional housing). Salary opportunities were also not realistically discussed. One reviewer thought a comparison should have been made between the high wages from oil and gas activities that do not last versus the moderate wages for tourism and outfitting that do last. They felt the Forest Service was biased

towards short-term economic gain, which is out of place in long-range planning. The boom-bust economics could lead to reduced wildlife populations.

Some commentators felt that only out-of-state people would be employed in the oil and gas industry and that profits from oil and gas development would be spent out-of-state. Therefore, Montanans would not benefit from oil and gas development. One reviewer felt more energy development should be allowed and that this would give a boost to the economy.

Commentators

LT11, LT162, LT186, LT190, LT215, and LT216.

Response

The rates for oil and gas leasing ($1 per acre per year) are set by the Bureau of Land Management. It should be noted that most returns, by far, are from oil and gas royalties, not leases.

Although the exact costs of boom-bust development were not reported, these costs are discussed in narrative form in Chapter IV. With the current amount of information, an accurate analysis of all aspects of energy development is difficult. Each step of energy development is subject to NEPA review. The DEIS-Supplement only discussed effects of leasing, seismic exploration, and a hypothetical field development.

As for salary opportunities, it is difficult to argue that towns based on tourism are more stable than towns based on oil and gas development. The towns of Cut Bank, Shelby, Glendive, Havre, and Malta all have economies with oil and gas development as a primary or secondary form of employment. Some of these towns have had energy development since the 1920s and are quite stable.

It is possible that a boom-bust development could lead to reduced wildlife populations. However, the effects of oil and gas activities on the wildlife on the Rocky Mountain Front are being carefully monitored. Decisions on specific oil and gas projects will be made only after careful analysis on a project-by-project basis.

Although some out-of-state people may be employed in energy development, most of the money and capital for energy development comes from out-of-state. Montanans would have some benefits from oil and gas activities, including additional taxes, jobs, and income.

Energy development would certainly boost Montana's economy. Almost all acres outside wilderness on the Rocky Mountain Division have been or could be leased with certain stipulations. The interdisciplinary team felt this is ample opportunity for energy development and did not change the recommendation in Alternative G, the Preferred Alternative.

Concern-Qualitative Benefits Versus Quantitative Benefits

A few questions were raised about qualitative benefits versus quantitative benefits and how this comparison was done. Some felt Alternative C maximized net public benefits. One person commented that the economic objectives were set without economic rationale and that there was no analysis to determine whether those economic objectives made sense. The DEIS analyzed only how to cut costs. A few reviewers questioned why benefit-cost ratios did not have more weight in the analysis.

Commentators

LT190, LT241, and LT245.

Response

The comparison between qualitative and quantitative benefits was done by the interdisciplinary team. In this comparison, which is given at the end of Chapter II, some of the rationale emerges as to why the alternative with the highest PNV was not chosen as the preferred alternative. The NFMA regulations clearly direct the Forest Service to choose the alternative which maximizes net public benefits. These benefits have two components, quantitative and qualitative. This terminology proved confusing to many people and was changed in the DEIS-Supplement to priced and non-priced, respectively. In analyzing the various alternatives, the interdisciplinary team started with a benchmark--maximum PNV--that would indicate what mix of resources could be produced that would maximize the PNV of those resources with market values or assigned market values.

From this point constraints were added which represented non-priced issues, such as retaining semi-primitive recreation areas, improving plant diversity, or increasing elk hunting quality. Each of these constraints would lower the PNV of each alternative, or lower the priced public benefits, while at the same time increase the non-priced

public benefits as compared to the maximum PNV benchmark. Alternative C did not maximize net public benefit in the evaluation of the interdisciplinary team.

In the DEIS, it was stated that Alternative C would maximize only the qualitative net public benefits, i.e., only the non-priced component of public benefits. This sentence was deleted in the DEIS-Supplement because it was confusing.

The objectives of an alternative do not have to be set with economic rationale. The objectives are set in response to public issues and management concerns. A large part of the analysis was concerned with cost efficiency in meeting those objectives. However, the interdisciplinary team analyzed the maximization of net public benefits with cost efficiency as only a management concern.

Benefit-cost ratios did not have much weight in the analysis. Again, the NFMA regulations and the criteria the interdisciplinary team used in recommending a preferred alternative is maximization of net public benefits. The maximization of a benefit-cost ratio often occurs at a different point than the maximization of net public benefits.

Concern-
Landownership Patterns

One reviewer requested that the PNV for various landownership patterns be calculated.

Commentators

LT20.

Response

The PNV for various landownership patterns did not emerge as an important issue. Although this information might be useful, the calculation would be difficult to do, because of the endless combinations that could be considered.

SOCIAL

Of the 436 comments on the DEIS and Proposed Forest Plan, 49 (10 percent) commented on social impacts.

Concern-Employment and Income

Many comments stated the importance of Forest timber for local employment and income, especially in White Sulphur Springs and Choteau. Other reviewers referred to the responsibility of the National Forest in providing all types of employment. Some people felt that the Forest Service should be finding more opportunities for increasing local employment.

Commentators

PW55, PW136, PW137, PW169, LT84, LT85, LT89, LT95, LT104, LT106, LT120, LT133, LT135, LT136, LT144, LT147, LT181, LT222, and LT261.

Response

The Forest Service, a Federal agency and a neighbor, realizes its economic importance to local communities. The Forest Plan will gradually increase timber harvesting over the next 50 years. In the next decade, harvest will remain at the current level. In 10 years the Forest Plan will be assessed again. During that time the supply/demand relationship of timber will again be examined. The Forest could harvest more timber, but does not to protect and maintain other resource values.

Concern-Timber Demand

Some reviewers questioned how much real demand there was for National Forest timber. They felt the demand for lumber will remain depressed for sometime, and the local timber industry is controlled by the national economy, not local supply. Other commentators felt the demand will increase and that private lands have provided more than their share of the timber harvest in the last decade.

Commentators

LT62, LT79, LT120, PT224, and LT245.

Response

As part of the Resource Planning Act, the Forest Service must predict the demand for Forest resources. During the next decade, the demand for timber will probably stress a moderate course between strong economic recovery and low slumps felt during the past several years. Demands for most timber products are projected to continue to rise over the next five decades. This reflects expected growth in population, economic activity, and income.

Sawmills at Judith Gap, Townsend, Livingston, and Choteau have an annual, one-shift, production capacity of about 50 million board feet. These four mills process approximately 75 to 90 percent of the annual Forest harvest. Other volume is processed by several smaller mills as lumber, post, and poles. Over the last five years the Forest has sold most all of its timber sale program. The demand for Forest timber is continually evaluated.

Concern-
Recreation Jobs

Some reviewers thought that the importance of jobs generated by Forest recreation was understated or absent.

Commentators

PW44, LT11, LT117, LT190, and LT245.

Response

The DEIS predicted how changes in recreation opportunities, timber harvest, and grazing would impact local employment. With the exception of Alternative C, opportunities for increased resource utilization would create more jobs. The creation of additional employment associated with recreation under Alternative C helps to compensate for the loss of timber/ranching jobs in that alternative. In the FEIS, jobs have been separated by resource element.

Concern-
Oil and Gas

A few reviewers felt that the social impacts from oil and gas development on the Rocky Mountain Division would be unacceptable. In addition to impacting solitude of the Forest, transient workers in local communities would cause a boom-bust situation and would impact the lifestyle of the community.

Commentators

LT76, LT131, LT190, and LT215.

Response

Oil and gas exploration along the Rocky Mountain Front has been in progress for the past several years. Local people there have grown more familiar with exploration activities and with oil and gas workers. Many workers live and work at the drill rig and are seldom seen. It is difficult to predict if any large gas discovery will be made on the Rocky Mountain Division. If sufficient quantities of gas or oil are found, development would probably proceed at an orderly pace. At some stage, construction workers would leave the area, and only maintenance jobs and royalties would continue for the life of the field.

Concern-
More Employment and Income

One reviewer stated that energy production on the Rocky Mountain District is not needed for employment and income because:

(1) Export of goods and services is not necessary for a region's economy.
(2) Montana's employment problems are caused by national problems such as inflation and the cost of energy.
(3) Long-term job security with ranching/ agriculture and tourism on the Rocky Mountain District is preferable to the high income boom-bust development associated with oil and gas.

Commentators LT190.

Response A region may be economically self-sufficient and need not support goods and services to remain healthy. Traditionally Montana has relied heavily on its export of minerals, grain, lumber, and beef. The State also has relied on out-of-state recreational dollars (an "export" of Montana's recreational opportunity). This reliance will most likely continue. It is felt that any oil and gas development on the Rocky Mountain Division will not be a boom-bust situation and traditional job security will remain.

Concern - Social Factors

Tables 3.4 and 3.5 do not reflect the racial composition of the population, which includes many Native Americans. The DEIS does not state specifically how the proposed policies and actions will impact employment opportunities for minorities and women. All of Lewis and Clark County should be included in the Area of Influence.

Commentators LT41 and LT55.

Response We agree, this information has been added to the FE

Concern- Blackfeet Treaty Rights

One commentator stated the Proposed Plan did not mention how on-going activities pertain to the Blackfeet Indian Treaty Rights.

Commentators LT93 and LT99.

Response The Blackfeet Indian Treaty Rights are discussed in Management Standard H-1, Native American Claims. While there are several issues that may take legal review, we are meeting with representatives of the Blackfeet Tribe to isolate and discuss issues over which we can agree.

ALTERNATIVES

Of the 436 comments on the DEIS and Proposed Forest Plan, 114 (26 percent) commented on one or more of the alternatives.

Concern-Alternative E

Sixty-two reviewers favored Alternative E. It was favored because there was no regulated timber harvest program on the Rocky Mountain Division. Some added that the harvest of posts, poles, houselogs, and firewood on the Rocky Mountain Division was acceptable. Two reviewers favored E-2 because it met the RPA program.

Commentators

PW55, PW197, LT76, LT111, LT114, LT121, LT125, LT128, LT129, LT130, LT131, LT134, LT138, LT139, LT142, LT149, LT151, LT152, LT153, LT161, LT164, LT166, LT167, LT169, LT170, LT171, LT173, LT174, LT177, LT178, LT185, LT186, LT197, LT199, LT202, LT211, LT214, LT216, LT218, LT219, LT221, LT235, LT236, LT240, LT244, LT246, LT247, LT248, LT249, LT250, LT251, LT252, LT253, LT254, LT256, LT257, LT259, LT262, LT263, LT270, and LT274.

Response

The Preferred Alternative (G) will have a small sale program on the Rocky Mountain Division. The allowable sale quantity will be limited to 0.5 million board feet per year, and no permanent roads will be constructed.

Alternative E would drastically lower the quality of elk hunting on the Jefferson Division because nearly every semi-primitive area of high public interest would be accessed in order to sustantially increase the production of priced outputs (particularly timber and range).

Concern-Alternative F

Fourteen reviewers commented on Alternative F. About half the comments supported the alternative, while the other commentators disagreed with all or part of the alternative.

Commentators

PW39, PW67, PW106, PW129, PW180, LT2, LT46, LT68, LT72, LT79, LT96, LT115, LT188, and LT245.

Response

In response to public comment, a new preferred alternative has been developed in the DEIS-Supplement, Alternative G. This alternative maintains more elk habitat, reduces the increase in grazing to protect wildlife values, creates a management area for semi-primitive recreation without

additional road construction, and sets stronger standards for wildlife, soil, and watershed protection.

Concern-Alternative C

Nineteen reviewers favored Alternative C. Some commentators were concerned with decreases in wildlife population with other alternatives.

Commentators

PW10, PW20, PW21, PW59, PW60, PW87, PW92, PW98, PW201, PW202, LT1, LT43, LT44, LT46, LT61, LT93, LT96, LT155, and LT241.

Response

Alternative C provides a high level on non-priced benefits, but was not recommended as the Preferred Alternative by the interdisciplinary team because it does not maximize net public benefit. Alternative G (Preferred) will maintain current wildlife populations.

Concern-Current Plan

Seven commentators favored the Current Plan. They did not want any changes in the management of the Forest.

Commentators

PW20, PW21, PW62, PW76, PW114, LT3, and LT109.

Response

The Current Plan does not take advantage of opportunities to increase timber and range outputs, where conflicts with other resources are minimal. The Current Plan would develop 408,000 acres of roadless land, the retention of which has emerged as a major public issue. Greater net public benefits are obtained from Alternative G (Preferred).

Concern-Other Alternatives

Four commentators favored Alternative A-2 because it met the RPA Program. One reviewer was against Alternatives A and B because of their effects on wildlife. One reviewer favored a combination of Alternative C, F, and the Current Plan.

Commentators

PW55, LT44, LT80, LT150, LT154, and LT198.

Response

Alternative A-2 has high commodity output, but was not selected because it has the greatest impact on the quality of elk hunting, accesses nearly every area of high public interest, and would decrease the quality of T&E habitat. The impacts of Alternatives A and E on wildlife were recognized and considered in the interdisciplinary team evaluation of net public benefit.

Concern-Additional Alternative

Two reviewers did not think there was a reasonable range of alternatives. Another thought there was need for a non-commodity alternative. Another thought is that a "No Action" (no timber harvest, grazing, and oil and gas) should have been presented. One reviewer thought it was unclear if Alternative F (Departure) was a separate alternative.

Commentators

PW67, LT2, LT98, LT238, and LT241.

Response

The Forest believes it has developed a reasonable range of alternatives (16) that could be analyzed by the Forest and that were responsive to public issues and management concerns. These alternatives consider a broad range of outputs ranging from high amenity values through high commodity production. Additional information on the range of alternatives has been added to the final EIS.

In the case of land management planning, "no action" is "no change" from current management direction. A Minimum Level Benchmark (no grazing, timber harvest, oil and gas development, or developed recreation) was developed but was not carried forward as an alternative because it failed to adequately address issues and concerns on the Forest. Alternative F (Departure) is a separate alternative. Changes have been made in the DEIS-Supplement to reflect this.

Concern - Other Comments

One reviewer was against any alternative which increased the timber harvest. Two commentators were opposed to any alternative which decreased wildlife populations. One reviewer supported multiple use management, while another supported the alternative with the least social and biological impact. One reviewer thought there was, "room for everyone", while another thought the highest and best use of the Forest was to support big-game and livestock. One reviewer thought that the alternatives were too complex.

Commentators

PW25, PW52, LT17, LT46, LT61, LT188, and LT190.

Response

No response necessary.

Concern-Alternative Effects

Two commentators did not agree with the effects of grazing and timber harvest on fish and wildlife. One questioned why Alternative C harvested on the steep, low production slopes of the Jefferson Division.

Commentators

LT223 and LT245.

Response	Effects were determined by resource specialists based on the resource allocations of each alternative. Some effects were directly computed by the FORPLAN model. Other effects were determined by the assumptions, methods, and calculations in the planning record, "Outputs and Effects." Alternative C harvests timber on 25 percent of the steep, low production sites in the Jefferson Division. This is partly in response to meeting a high level of wildlife habitat improvement (1228 acres) in a cost-effective way.

MANAGEMENT AREAS

Of the 436 comments on the DEIS and Proposed Forest Plan, 96 (22 percent) voiced a concern with specific areas to a particular management area.

Concern- Rocky Mountain Division

Numerous reviewers supported semi-primitive recreation for the Rocky Mountain Division. They also recommended that Management Areas A and B in the Two Medicine, Teton, Benchmark/Willow, and Elk Creek/Falls Creek Geographic Units be changed to semi-primitive recreation.

Commentators

LT2, LT62, LT76, LT93, LT111, LT114, LT117, LT121, LT125, LT126, LT128, LT129, LT130, LT131, LT139, LT142, LT149, LT151, LT152, LT153, LT161, LT164, LT166, LT167, LT168, LT170, LT171, LT173, LT174, LT177, LT178, LT179, LT180, LT185, LT186, LT197, LT199, LT202, LT211, LT214, LT216, LT218, LT219, LT221, LT235, LT236, LT240, LT244, LT246, LT247, LT248, LT249, LT250, LT251, LT252, LT253, LT254, LT256, LT257, LT259, LT262, LT263, LT266, LT269, and LT274.

Response

The allocation of specific areas on the Rocky Mountain Division has been re-evaluated. Under the final Plan, on the Rocky Mountain Division timber harvest was still proposed in the Teton, Benchmark/Willow, and Elk Creek Geographic Units. However, sale size and road development would be carefully controlled. There has been some adjustment of management area boundaries to reduce resource conflicts. The upper South Fork and West Fork Teton has been recommended for wilderness classification. The Two Medicine and Falls Creek Geographic Unit have been eliminated from regulated timber harvest.

Concern- More on the Rocky Mountain Division

A few other reviewers did not support the proposed management for other areas on the Rocky Mountain Division.

Commentators

Benchmark: PW122, LT30, and LT76.

Deep Creek: PW116.

Petty Creek: LT2 and LT37.

Two Medicine: LT55 and LT208.

Waggner Basin/George Gulch: PW258.

North Fork of Ford Creek/Red Creek: PW258.

Elk Creek/Falls Creek: LT2 and LT150.

Sawtooth: LT30.

Olney Creek: LT55.

Teton: LT76, LT150, and LT188.

Badger: LT120 and LT188.

Birch Creek: LT188.

Response

All management areas have been reviewed by resource specialists and land managers to insure the proposed management direction fits the land's capability and reflects the intent of the Forest Plan. In response to public concern, many changes have been made in management areas, management area direction, and management area allocations.

Concern-Hoover Springs-Oti Park

On the Jefferson Division, some reviewers recommended that the Hoover Springs-Oti Park area be managed for semi-primitive recreation.

Commentators

PW73, PW78, PW239, LT180, LT188, LT191, LT208, and LT224.

Response

The Hoover Spring-Oti Park area has been changed from Management Area B to F (semi-primitive recreation) to protect important elk security habitat.

Concern-Tenderfoot-Deep Creek

Several commentators supported the proposed management (Management Area G) for the Tenderfoot-Deep Creek area, but they recommended that the areas east of Fisher Creek and Rugby Creek be included in Management Area G. One reviewer felt the Taylor Hills area should be included in Management Area G. Two commentators questioned the foregone opportunity to harvest timber in the management area.

Commentators

PW80, LT6, LT8, LT150, LT158, LT160, LT180, LT188, LT191, LT194, LT195, and LT238.

Response

We agree, the lower portions of the Fisher Creek and Rugby Creek drainages and the Taylor Hills have been included in Management Area G (now Management Area F).

Concern-Developed Recreation

Three commentators felt the South Fork Judith, Thain Creek Campground, and Moose Creek should be in Management Area H (developed recreation).

Commentators

PW15, PW224, and LT188.

Response

We agree, these areas have been changed to Management Area H.

Concern-Research Natural Areas	Two reviewers supported Paine Gulch as a Research Natural Area. One reviewer questioned if a road penetrated the Paine Gulch Research Natural Area. One reviewer recommended that the Big Snowies be managed as a Research Natural Area.
Commentators	PW26, PW74, LT180, and LT188.
Response	No road construction is allowed in the Paine Gulch Research Natural Area. There are no existing roads. The Big Snowies does not meet the targets for Research Natural Areas.
Concern-Highwoods	There should be some designation for wildlife in the Highwoods. Arrow Peak should be Management Area G.
Commentators	LT188, PT224, and LT238.
Response	The proposed management for the Highwoods has been reanalyzed. Important wildlife habitat in the Highwoods has been designated as Management Area E.
Concern-Middle Fork Judith	The Middle Fork Judith should be designated as roadless or as a special wildlife area. One reviewer recommended moving Management Area B to above the Middle Fork Ranch. Another reviewer recommended logging several drainages proposed for semi-primitive recreation.
Commentators	PW11, LT150, LT158, PT224, and LT273.
Response	The opportunity to harvest timber while protecting the high elk values in the Middle Fork was carefully reviewed. The area proposed for timber management was reduced to 11,600 acres. The proposed timber harvest area would be above the Middle Fork Ranch. This will protect elk calving areas, and maintain elk security cover, and prevent a through road system from developing. The management area has been changed to C, which will provide more effective habitat for elk.
Concern-Castle Mountains	Two reviewers supported the proposed management direction for the East Castles (CA-1), Richardson Grasshopper (CA-2), and Wood Chuck Mountain (CA-3) areas.
Commentators	LT188 and LT238.
Response	No response needed.

Concern-Management Areas E and G	Two reviewers questioned why Management Areas E and G do not include regulated timber harvest.
Commentators	LT239 and LT243.
Response	Management Area E consists of lower elevation grassland. Therefore, timber management opportunities are very limited. Management Area G consists of large areas of undeveloped lands. Timber values are low, and development costs are high.
Concern-Dry Wolf and Dry Fork Belt Creek	The West Fork Dry Wolf Creek and Dry Fork Belt Creek should be in Management Area E to provide for grazing.
Commentators	PW15 and PT224.
Response	These areas are in Management Areas A and B. Both management areas provide for grazing.
Concern-Palisades, Chamberlain, and Big Snowies	Lands in the Palisades, Chamberlain, and Big Snowies have already been roaded and logged, yet they are included in Management Area G.
Commentators	LT150.
Response	We agree, the developed land in these areas have bee included in Management Area B.
Concern-Forest Lake	Forest Lake should be in Management Area G.
Commentators	LT158 and LT238.
Response	These areas have been reviewed. No changes have been made.
Concern-Monarch Mountain	Monarch Mountain should not be in Management Area H.
Commentators	LT188.
Response	Although no developed recreation facilities are proposed for Monarch Mountain, the area fits with the overall management direction for Management Area H.
Concern-Management Areas	One commentator did not think Management Area G was progressive land management. Two reviewers did not think Management Area B provided enough protection for elk. Another reviewer felt there should

be a management area that emphasized roadless recreation, while another reviewer recommended a special management area for the Continental Divide National Scenic Trail.

Commentators PW200, LT188, LT222, and LT238.

Response Management Area G is generally not suited for commodity production. In response to public concern, additional management direction has been added to Management Area B to protect elk habitat. Management Area F has been developed to provide semi-primitive recreation--no additional roads will be constructed for surface resources. The final routes for the Continental National Scenic Trail have just been designated. Management areas are compatible with these routes for the Continental Divide National Scenic Trail. Forest-Wide Management Standard A-7 has been added to guide the management of the trail.

Concern- Spring Creek

One reviewer did not see a need for Road #6393 in Spring Creek.

Commentators PW64.

Response This road is needed to access timber in the adjacent area. Most of this road has already been constructed.

Concern- General Comments

Several reviewers favored keeping the Forest as it is today. Some mentioned specific areas, such as the Crazies, Deep Creek, Home Gulch, Rocky Mountain Front, and the Middle Fork Judith that they wanted to remain without change.

Commentators PW24, PW49, PW58, PW76, PW78, PW101, PW112, PW114, PW125, LT97, and LT107.

Response No response needed.

Concern- Prescriptions

The State of Montana felt that the land management prescriptions of the Preferred Alternative are neither reflective of, nor justified by the level of resource inventory available in the draft.

Commentators LT273.

Response There are over 175 pieces of resource information for each land unit (capability area). The EIS is not the appropriate place to display this information. Management prescriptions are multi-resource in nature, and are consistent with Forest Planning in the Northern Region.

ADMINISTRATION

Of the 436 comments on the DEIS and Proposed Forest Plan, 35 (8 percent) had concerns with Forest administration.

Concern- Road Closures

Some reviewers were concerned with the ability of the Forest Service to enforce road closures.

Commentators

PW6, PW12, PW13, PW14, PW16, PW21, PW41, PW176, PW177, LT156, LT163, and LT201.

Response

Travel Plans are maps which show restrictions on roads, trails, and off-road areas. All closures and restrictions are reviewed in light of the Forest's ability to enforce them. Greater emphasis will be placed on enforcing closures and restrictions. Public cooperation and understanding is a vital part of travel planning.

Concern- Forest Service Employees

A few commentators questioned if additional employees would be needed to implement the Forest Plan. Other commentators felt more people are needed in the field to protect and administer the Forest.

Commentators

PW94, PW97, LT119, LT156, LT175, and LT201.

Response

Implementing the Forest Plan might require a slight increase in Forest Service employees, in later decades. However, the Forest uses many ways to accomplish its work, such as contracting, volunteers, and improved technology, which do not require additional employees. The Forest has restrictions on the annual number of employees. Employee management plans are reviewed yearly, and every effort is made to protect and administer the Forest in a cost-efficient manner. This information has been added to the final EIS.

Concern- Management

Some reviewers suggested improvements or changes in the management of the Forest.

Commentators

PW79, PW109, PW113, PW121, PW126, PW171, PW172, PW203, PW214, PW232, and LT115.

Response

All suggestions for improved Forest management were reviewed by Forest administers and will be considered in the day-to-day management of the Forest.

Concern-Range Administration	A few reviewers criticized range allotment administration.
Commentators	PW96, PW133, LT81, and LT188.
Response	The Forest also recognizes the need for additional range allotment administration. The Forest is continually working to provide the needed administration, to manage the range resource, and to protect other values.
Concern-Budget	Two commentators questioned, if Forest Service budgets were not adequate for resource protection and administration, would output levels be reduced?
Commentators	PW97 and LT188.
Response	The Forest Plan recognizes the possibility of varying yearly budgets. (See Forest Plan, pages 1-3 and 1-4.) Normally, variations will be within the scope of the Forest Plan. Output levels are usually reduced or increased to reflect changes in program budgets. The cost and output data coupled with computer technology enables the Forest to quickly analyze any budget and output changes.

ENVIRONMENT

Of the 436 comments on the DEIS and Proposed Forest Plan, 7 (2 percent) commented on the overall environment.

Concern-Development and Time

One reviewer cautioned that today's environment is at best unpredictable and at worst degrading. One commentator felt the Forest Plan did not make economical or environmental sense. Another thought the potential timber yield increase, from 13 to 24 million board feet, is a mistake both economically and environmentally. One commentator felt that the proposed protection for wildlife, wilderness, and the overall environment is not adequate. One reviewer did not favor oil and gas development, because too much pressure was put on wildlife and the environment. One commentator thought the Forest Service should think in generations, not centuries, and that the Forest Service has a built-in bias for short-term gain.

Commentators PW154, LT18, LT37, LT61, LT205, and LT208.

Response No response needed.

Concern-Alternative F

One reviewer questioned why Alternative F included harvest on 15 percent of the steep, low productivity sites on the Jefferson Division. How can this timber harvest be economically and and environmentally justified?

Commentators LT241.

Response Under Alternative F, FORPLAN constrains the timber harvest to protect semi-primitive recreation values. In order to obtain 24 million board feet by 2030, the computer seeks the most cost-efficient areas. Some of these areas would be accessed by roads going into adjacent general forest areas, where the additional cost to harvest timber is not great. Alternative F also has a wildlife habitat improvement program of about 500 acres yearly. Some of these acres are obtained by harvesting timber from winter ranges on the steep, low productivity sites on the Jefferson Division.

RESOURCES	Of the 436 comments on the DEIS and Proposed Forest Plan, 9 (2 percent) addressed resource use and management.
Concern-Summary of Major Comments	Three commentators favored the development and use of Forest resources. One reviewer urged the preservation of natural resources, while another reviewer thought more consideration should be given to the Rocky Mountain District's unique resources. One commentator felt it was alright to use Forest resources as long as wildlife could be protected. Another commentator wanted the impacts of nondevelopment of all resources carefully considered. The last reviewer stated that there could be a loss to out-of-state people if resources are overused.
Commentators	PW24, PW137, PW145, PW149, PW180, LT1, LT61, LT154, and LT188.
Response	No response needed.

MULTIPLE USE	Of the 436 comments on the DEIS and Proposed Forest Plan, 18 (4 percent) commented on multiple use management.
Concern-Summary of Major Comment	Several commentators supported multiple use of the Forest. Some qualified their statements with, "more multiple use timber harvest," "against wilderness," "multiple use must be considered in many areas," and "for multiple use, not just recreation and wildlife." One reviewer was against the Forest Plan because it departs from multiple use management. Two commentators supported using Forest resources. One reviewer thought the recommended wilderness and wilderness study areas should be reanalyzed to identify other multiple use opportunities. One reviewer thought a more balanced multiple use program could be developed that would permit greater use of wildlife and timber. One commentator cautioned that multiple use management should not be sacrificed to meet commodity goals. Another reviewer felt abandoning the current timber sale policy would bring back the multiple use concept.
Commentators	PW4, PW52, PW129, PW135, PW137, PW145, PW210, LT25, LT98, LT115, LT120, LT148, LT150, LT176, LT183, LT204, LT222, and PT224.
Response	No response needed.

RPA (RESOURCE PLANNING ACT)

Of the 436 comments on the DEIS and Proposed Forest Plan, 12 (3 percent) addressed the RPA Program.

Concern-
Purpose of RPA

A few reviewers stated that RPA is to project and meet future demands for forest and rangeland resources. The Lewis and Clark Forest Plan has fallen short of the RPA levels in timber, range, and wildlife.

Commentators

LT108, LT120, LT137, LT150, LT222, LT239, and LT243.

Response

The National RPA Program, which is developed every 5 years, assigns goals and objectives to each Forest Service Region. Goals and objectives from the 1980 RPA Program have been distributed from the Region to individual National Forests. The NFMA implementing regulations require that the planning process formulate and evaluate a range of management objectives, including one alternative which responds to the tentative RPA Program. The approval of the Forest Plan by the Regional Forester may incorporate adjustments of the tentative RPA Program for the Forest. The information in the Forest Plan is being used for the 1985 RPA update.

Concern-
Water Quality

RPA calls for the elimination of erosion and maintenance of water quality. The Lewis and Clark Forest Plan violates these goals.

Commentators

LT113, LT198, and LT245.

Response

All reasonable land, soil, and water conservation practices will be applied to prevent any new management-caused erosion. However, erosion is a naturally-occurring process and some additional sediment is produced by management activities. The Preferred Alternative (G) could increase sediment about 1 percent. The intent of RPA is to protect and, where appropriate, improve the quality of soil, water, and air resources. The Forest feels that the Lewis and Clark Plan meets this intent.

Concern-
RPA Goals

One reviewer questioned the use of unrealistic RPA commodity goals.

Commentators

LT215.

Response

One purpose of the Analysis of the Management Situation is to determine resource potentials. This analysis shows which goals the Forest could meet and which goals are not realistic. This analysis was discussed throughout Chapter II.

PROCESS

Of the 436 comments on the DEIS and Proposed Forest Plan, 18 (4 percent) addressed the EIS or Forest Plan process.

Concern- Public Involvement

A few reviewers commented on public involvement. One reviewer thought there had been too much emphasis on comments obtained from public workshops, and that land management decisions are being based upon "vote counting." Another reviewer questioned the validity of the comments obtained from the original public workshops, because of lack of interest and participation. One commentator felt that local public opinion doesn't impact the Regional Forester's decisions. Another reviewer questioned, "What impact do organizations and individuals have on your assessment?" One commentator cautioned not to be swayed by too many people telling you how to do things. One reviewer wanted to know how to be most effective in voicing an opinion.

Commentators

PW99, PW175, PW178, PW179, LT150, LT188, and LT239.

Response

Comments from Public Workshops were treated the same as written responses. There were about equal responses from the workshops and letters. All comments were reviewed by the Forest Supervisor and management team. Responses were prepared by the planning team. Over 4,500 comments on the DEIS were analyzed. The number of respondents is given to show the amount of public concern. Public involvement is just one of the criteria used by the Forest Service in making decisions.

The Regional Forester is very aware of public responses and has reviewed the responses and analysis for the Lewis and Clark Forest Plan. The most effective way to comment is to be as specific as possible.

Concern- More Information

A few reviewers felt other information should have been used in developing the Forest Plan, including elk-logging studies, security areas for wildlife, a biological evaluation on T&E species, the Travel Plan, and mitigation measures for T&E species.

Commentators

LT188, LT210, LT236, and LT241.

Response

Elk-logging studies and security areas were considered in the Forest Plan. Specific references and requirements have been added to the Forest Plan. A biological evaluation on T&E species has been made.

Mitigating measures for threatened and endangered species relative to range, timber harvest, and facility construction and maintenance have been added to the Forest-Wide Standards. The Travel Planning Standard (L-2) has been expanded to give more direction.

Concern-
Planning Team

One reviewer stated that the planning team consisted almost entirely of foresters, and thereby fails to conform to the interdisciplinary requirements of NFMA regulations.

Commentators

LT238.

Response

Many disciplines were represented on the Lewis and Clark Forest Planning Team. They included forestry, range management, wildlife management, soils, geology, engineering, watershed management, fire management, social science, economics, recreation, and public information. The interdisciplinary team members and their education and experience are listed in Chapter V. Of the 21 people on the planning team (resource and systems core group) 12 have non-forestry degrees.

Concern-
EIS Chapter IV

Chapter IV does not discuss environmental impacts, but compares alternatives.

Commentators

LT241.

Response

EIS Chapter IV, Environmental Consequences, is the scientific and analytic basis for the comparison of the alternatives described in Chapter II. It includes the environmental consequences as defined by NEPA. Many changes were made in this chapter in the DEIS-Supplement and FEIS.

Concern-
Comment Period

One reviewer requested a second DEIS or a 120-day extension of the comment period. Another commentator was disappointed that the comment period was not extended.

Commentators

LT190 and LT234.

Response

The purpose of a DEIS is to gather and consider comments. The comments are used to:

(1) Modify alternatives including the proposed action.
(2) Develop and evaluate alternatives not previously given serious consideration.
(3) Supplement, improve, or modify its analysis.
(4) Make factoral corrections.

(5) Explain why the comments do not warrant further response or, if appropriate, which comments require reappraisal or further response.

The original comment period was extended 30 days. Because of a change in the planning regulation a DEIS-Supplement and Revised Proposed Forest Plan was prepared and submitted for public comment.

Concern-FORPLAN

One reviewer wanted to know how FORPLAN was used in developing alternatives, maps, and the preferred alternative.

Commentators

PW190.

Response

The use of FORPLAN is described on page 2-2 of the DEIS (Appendix B of the FEIS).

Concern-Economics and Timber

One reviewer was unable to obtain documents which analyzed the economic suitability of timber producing land and was told such an analysis had not been done. The reviewer requested the Forest to prepare an analysis of the economic suitability of timber producing land as required by 36 CFR 219.4(b) and submit it to the public for appropriate comment and review.

Commentators

LT223.

Response

Both objective functions 9 and 10 (FORPLAN) were run for Alternatives F and G (Preferred). The computer reports analyze the economic suitability of timber producing lands. They are and have been available as part of the planning record for the Lewis and Clark Forest Plan.

Concern-Effect on Elk

One reviewer questioned how the effects on elk of increasing livestock was calculated, and felt that under Alternative C many factors would affect elk numbers, including the hunting season controlled by the Montana Department of Fish, Wildlife, and Parks and the State. The reviewer also questioned how elk hunter days were calculated, because the system was designed to determine effects on a hunting district basis. When calculated on a Forest-wide basis, it greatly reduces the value of the data.

Commentators

LT245 and LT273.

Response

Under all alternatives, many factors affect elk numbers. The procedures, assumptions, calculations, and results are documented in the planning records. These calculations were made by the Forest wildlife biologist in consultation with other planning team members.

Ideally, hunter days would be more meaningful if they were determined on a small unit basis. However, the number of hunting districts on the Forest, the inclusion of other landownership, and the structure on the FORPLAN model make such an analysis impossible. Hunter days were developed by mountain range and were combined for display in the EIS. The uniform approach for determining hunter recreation days was developed by the Forest Service's Northern Region in consultation with the Montana Department of Fish, Wildlife, and Parks.

Concern-
Commercial Land

Since new NFMA regulations no longer define suitable timber land as land which grows 20 cubic feet per acre per year, one reviewer anticipated the Forest would have to re-examine their suitable timber land base.

Commentators

LT243.

Response

The new NFMA regulation (36 CFR, Part 219, September 30, 1982) did not retain the 20 cubic feet growth criteria; however, the regulations provide that if a plan has been released in draft form for public review, the plan need not be modified to incorporate requirements of such amendment (219.19b(1)).

DEIS-SUPPLEMENT & REVISED PLAN

DEIS-SUPPLEMENT & REVISED PROPOSED FOREST PLAN

The public review period for the DEIS-Supplement and Revised Proposed Forest Plan began on November 9, 1984. The comment period ended March 15, 1985. During this time 600 DEIS-Supplements and Revised Proposed Forest Plans were distributed to Federal, State, and local agencies and interested publics. Copies were also made available for review at Forest Service offices and local libraries.

The Forest hosted 31 meetings with local publics, special interest groups, and Federal, State, and local agencies. Five meetings were held with Forest Service personnel. Over 600 people attended these meetings.

Over 577 individuals, organizations, businesses, or agencies responded with 531 letters (RLT), form letters (FLT), form post cards (FPC), oral responses (OR), or petition letters (PLT), on the DEIS-Supplement and Revised Proposed Forest Plan. Commentators are listed in Appendix F.

Of the 531 responses---

22 were from businesses
22 were from conservation organizations
3 were from State agencies
5 were from Federal agencies
470 were from individuals
2 were from local agencies
7 were from user groups

Of the 531 responses---

223 were from the Forest's Zone of Influence
244 were from the rest of Montana
64 were from out-of-state

DEIS-SUPPLEMENT & REVISED PLAN

Most of the 531 commentators were concerned about several aspects of several resources. Therefore, each letter has numerous comments. The total number of comments, by resource, is listed below:

Resource	No. of Comments
Recreation	162
Wilderness	333
Fish and Wildlife	198
Range	37
Timber	239
Minerals	202
Soil and Water	29
Lands	16
Facilities	53
Protection	21
Economics	89
Social	28
Alternatives	17
Management Areas	56
Administration	7
Multiple Use	7
Process	449

Following is a summary of the major comments and the Forest Service response. Comments on the DEIS and Supplement are discussed separately.

RECREATION

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 71 (13 percent) commented on recreation.

Concern- Public Access

Some commentators felt that lack of public access denied them recreational and other opportunities on the Forest. However, others felt increased access would hinder the recreational quality and decrease wildlife habitat. Two reviewers felt the planned trail access into Smith Creek on the Rocky Mountain Division should be changed to road access. One commentator pointed out the special problem of checkerboard ownership patterns and public access.

Commentators

RLT-119, RLT-143, RLT-375, RLT-388, and RLT-389.

Response

Public access needs were carefully reviewed and the right-of-way program was updated. (See Appendix C, Forest Plan.) Public trail access has been obtained into Smith Creek. The Forest feels that because of the terrain, trail access is more appropriate than road access in this area. The Forest recognizes the special problems of checkerboard ownership and is working to resolve some of the problems, such as access.

Concern- Off Road Vehicles

Many reviewers expressed a concern for maintaining ORV recreation opportunity, especially snowmobiling opportunities. Others, including the State of Montana, expressed a desire for more ORV restrictions to protect recreation and wildlife (especially grizzly bears) and to reduce soil erosion. One reviewer felt that the Plan favored non-motorized recreational users. Another reviewer favored leaving the Haymaker Swamp-Daisy Creek trail open to motorized use in the summer. One commentator favored closing the Deep Creek area to motorized vehicles. Another reviewer favored closing the Badger-Two Medicine area to protect wilderness and wildlife values. Some commentators wanted the Travel Plan included in the Forest Plan.

Commentators

RLT-25, RLT-151, RLT-176, RLT-271, RLT-285, RLT-301, RLT-302, RLT-311, RLT-375, and RLT-395.

Response

The Forest Plan calls for a continuing update and awareness of the demand for motorized and non-motorized recreation on the Lewis and Clark National Forest - with usage based on the ability of the resources to sustain such activity. The

Plan also provides winter snow trails for both motorized and non-motorized use. Because of public comment, the Management Standard for Winter Dispersed Recreation Opportunity (A-5) has been expanded to encourage winter snow trail development, maintenance, and operation by the private sector. Additional information on road and trail management has also been added to Chapter IV of this EIS.

Many ORV restrictions are dictated by public safety, soil conditions, wildlife security, firewood availability, or desired type of recreation. The Forest Plan sets standards for open road densities and criteria for road, trail, and area restrictions. A Travel Plan, which regulates motorized vehicle use, was implemented in April, 1985, after extensive public involvement. It includes some restrictions on motorized use in the Badger-Two Medicine area. The Haymaker Swamp-Daisy Creek Trails are closed to vehicles and trail bikes yearlong to protect the soil resource. However, the trails are scheduled for reconstruction in order to accommodate motorized use. The Travel Plan is scheduled to be reviewed yearly and updated as needed.

Concern-Campgrounds

Four reviewers felt that the Forest Service should provide more campgrounds and other recreational facilities. The State of Montana and other commentators supported the development of new campgrounds during the first decade and the improvement of existing sites. They also stated developed recreation attracts national users and projections based on Montana's population growth are not realistic. One reviewer felt the initial capital investment costs should not deter the Forest from meeting the demands for developed recreation. Another commentator cautioned that campgrounds should be developed only in areas that are not environmentally sensitive. Two commentators questioned the priorities in protecting developed recreation sites from mineral development while wildlife and semi-primitive recreation areas were not protected.

Commentators

RLT-10, RLT-151, RLT-302, RLT-311, RLT-312, RLT-375, and RLT-395.

Response

Based on a review of our analysis no need is seen for new campgrounds until the year 2005 as the Forest will continue to meet the demand for developed recreation until that time. However, developed recreation use will be closely monitored,

and if the projected use changes, the need for additional facilities will be re-evaluated. Maintenance of campgrounds is to increase. Capital investment costs are not a deterant to meeting the demand for developed recreation. Suitable site for campgrounds is the major reason the Forest will not meet this demand after the fourth decade of the Plan. Proposed campgrounds are identified on Forest Plan maps. Environmental concern was a major criteria in selecting these sites. Any development would be proceeded by appropriate environmental analysis.

Concern-Trails

Three commentators supported increasing trail construction/reconstruction. Two commentators expressed concern with the management and direction for the CDNST (Continental Divide National Scenic Trail). One felt that proposed segments of the CDNST should be identified in the Forest Plan. The USDI (U.S. Department of Interior) urged cooperation with Glacier National Park on the protection and management of the CDNST.

Commentators

RLT-6, RLT-20, RLT-23, RLT-39, and RLT-144.

Response

The Forest Plan provides direction to manage CDNST as specified by the Secretary of Agriculture under Section 5(f) of the National Trail System Act, as amended (Management Standard L-3). The Forest feels it is inappropriate to designate proposed segments until the Study has been finalized. The CDNST Society reviewed and concurred with the proposed management along the CDNST trail corridor. The management of the CDNST is being coordinated with Glacier National Park. This information has been added to Management Standard L-3.

The Forest has reanalyzed trail conditions and agrees that additional trail construction/reconstruction is needed. The final Plan calls for 100 miles of trail relocation and new construction each decade. This is a 100 percent increase over the Revised Proposed Plan. A five-year trail construction/reconstruction program has been added to the final Plan (see Appendix S). It will be updated yearly. Also the private sector is being encouraged to develop winter snow trails for their use (Management Standard A-5, Winter Dispersed Recreation Opportunities, Forest Plan).

Concern-
Dispersed Recreation

Some people questioned the priority recreation received in the DEIS and Forest Plan. The State of Montana felt dispersed recreation was not adequately considered. Other reviewers felt wildlife and recreation was not given enough consideration, and that there would be an increasing demand for elk hunting and trout fishing. Other commentators felt that roadless recreation was given too much emphasis and thusly timber management opportunities were reduced. One reviewer questioned the need for additional primitive recreation opportunities. And, felt that road closures could be used to provide primitive recreation settings. Still other reviewers supported the maintenance of semi-primitive recreation opportunities. One reviewer supported additional recreational opportunities in a roaded environment because of increasing demands for this type of recreation. Some commentators favored increased recreation opportunity. Two commentators felt that although areas are to be managed for semi-primitive recreation that none of the prescriptions guarantee that the area will be maintained as roadless. Two reviewers, including the State of Montana, questioned that with the reduction in recommended wilderness, reduction in overall trail miles, loss of hunter opportunity (10 percent) and the reduction in semi-primitive recreation, if the Forest was truly emphasizing dispersed recreation as stated in the Plan.

Commentators

FLT-2, RLT-39, RLT-40, RLT-156, RLT-198, RLT-199, RLT-312, RLT-375, RLT-377, and RLT-395.

Response

The Forest has reviewed the role of dispersed recreation in the Forest Plan. The Lewis and Clark National Forest will continue to offer a wide variety of dispersed recreation opportunity. Activities will range from those requiring a natural environment to those requiring a more developed setting (roads and campgrounds). Over 65 percent of the Forest will be managed for wilderness, semi-primitive recreation, and wildlife values.

The Forest Plan emphasizes a spectrum of dispersed recreation opportunities, from primitive to rural. Under the final Forest Plan, dispersed recreation will be provided in the following settings:

Primitive	436,000 acres
Semi-Primitive	867,000 acres
Roaded Natural	528,000 acres
Rural	17,000 acres

Through increasing recreation information, maintaining the winter cabin rental program, providing winter snow trails for both motorized and non-motorized use, permitting a travel shelter program, and increasing the trail construction/reconstruction programs, the Forest feels it is emphasizing dispersed recreation (Management Standards A-1, A-4, and A-5, Forest Plan).

Because of mineral leases and other mineral rights the Forest cannot guarantee that an area will remain totally roadless (also many of the areas have existing low standard roads, many which will remain open for motorized use). Most areas, except wilderness, are available for mineral entry. However, any proposed road construction for mineral purposes will be carefully analyzed before it is approved to ensure other values are protected.

Concern-
Recreational Use

Some reviewers felt there would be more pressure on public nonwilderness lands for recreation, and that there was a need to improve public information on recreation opportunities. The State of Montana felt the RVD projection was flawed as it should be based on both Montana population trends and non-resident visitation projects.

The State of Montana and the Great Falls Cross Country Club supported the winter cabin rental program. The State also supported the cooperative development of a Smith River Management Plan. The Cross Country Club felt there was an increasing need for a "hut to hut" shelter system.

Commentators

RLT-123, RLT-126, RLT-260, RLT-286, and RLT-395.

Response

The Forest recognizes the growing pressure on public lands, and is working to expand the legal access to the Forest (also see Lands in this chapter). The Forest is also working to improve its trail system and other dispersed recreation opportunities. The Forest agrees that there is a need to improve the visability of recreation information (see Management Standard A-1, Recreation Information, Forest Plan).

The Forest appreciates the support for its winter cabin rental program and the Smith River Management Plan. The Forest is also working with winter user groups on a travel shelter system (see Management Standard A-4, Travel Shelters, Forest Plan).

Projections on recreational use were made using the best information available. The Forest recognizes the important role of non-resident visitors. Recreational use will be closely monitored to ensure projections are reasonable (see Forest Plan, Chapter V). The Forest has found the weather is a major factor in yearly recreational use.

Concern-
Visual Resource

The State of Montana felt the use of "should" when referring to visual quality rehabilitation makes the intent of the discussion unclear. They also felt the cost of visual rehabilitation must be included in the cost of proposed projects. One reviewer was concerned with the protection of the seen area from U.S. Highway 2 and Trail No. 101 (listed as visually sensitive in the Forest Plan) when development was planned in these areas. One commentator questioned the benefit of leaving a strip of trees along a road. While another reviewer felt that the visual quality aspect had been overestimated.

Commentators

RLT-20, RLT-240, RLT-285, and RLT-395.

Response

The Forest has reviewed the use of "should" in the Visual Quality Objective (page 3-3, Forest Plan) and feels that its usage is appropriate. Because of some uncertainity with rehabilitation, the Forest cannot guarantee that disturbed areas can be rehabilitated to an EVC (Existing Visual Condition) Class 3 within 2 years. In some instances, the rehabilitation may take longer.

Visual rehabilitation cost are included as cost to a project.

The seen areas from U.S. Highway 2 and Trail No. 101 will be managed to ensure the protection and enhancement of their scenic values (see Management Standard A-8, Forest Plan). However, this does not mean that management activities are prohibited, rather that they must remain subordinate to the landscape.

Vegetative screening is one way to mitigate the effects of timber harvest on the visual resource. An excellent example of this technique is the Swan Highway (State Highway 83) where a strip of trees screen the highway. The Forest feels the Visual Quality Objectives are necessary and appropriate.

Concern- Cultural Resources	The SHPO (State Historic Preservation Office) and USDI were concerned that the cultural resources overview would not be completed in a timely manner. The USDI also urged consultation with the Blackfeet Indians in identifying archeological sites that may be important to them. The SHPO have several suggestions for improving Cultural Resource Management Standard A-6 in the Forest Plan. The SHPO was also concerned with maintaining the cultural resource position of the Forest.
Commentators	RLT-13 and RLT-144.
Response	The Forest recognizes the completion of the cultural resources overview will not be accomplished for several years. Funding for the cultural resource overview is based on regional priorities. The current funding program reflects the low level of planned development and the moderate potential for cultural resource discoveries on the Lewis and Clark National Forest. The Forest is continually consulting with the Blackfeet Indian in identifying archeological sites that are important to them. The Forest agrees and Management Standard A-6, Cultural Resources Management, has been changed to reflect the suggestions of the SHPO. The Forest plans to maintain the cultural resource position.

WILDERNESS

Of the 531 comments on the DEIS-Supplement and the Revised Proposed Forest Plan, 286 (54 percent) had a comment on wilderness recommendations, or wilderness recreation demand, or wilderness management.

Concern-Wilderness Recommendations

Many reviewers made specific recommendations for wilderness classification. Many people wanted unroaded lands on the Rocky Mountain Division added to the wilderness system. High wilderness quality and a desire to protect the area from development, especially oil and gas development, were stated. Several commentators felt wilderness values outweighed any possible economic return. Other commentators felt that the grizzly bear, other wildlife, and recreation values would be better protected under wilderness classification. One reviewer stated that there is no guideline in the Wilderness Act stipulating that oil and gas potential should eliminate an area from wilderness consideration. Many reviewers identified specific areas on the Division they felt should be classified as wilderness. Many people recommended full protection for the Renshaw and Silver King/Falls Creek areas. Other commentators felt that the careful nonwilderness management of the areas would protect them as well as provide the opportunity to explore for oil and gas resources and provide for diverse recreational opportunities.

On the Jefferson Division, some people recommended wilderness classification for the Middle Fork Judith, Big Snowies, Tenderfoot/Deep Creek, Crazy Mountains, and Pilgrim Creek areas. These reviewers felt that the areas had good, representative wilderness qualities and lacked other resource values. Some commentators felt that neither the Middle Fork Judith nor Big Snowies should be wilderness, and the areas should be developed for timber and other resources.

Commentators

Rocky Mountain Division:

For Wilderness Classification: FLT-3, FPC-1, PLT-2, RLT-9, RLT-14, RLT-27, RLT-38, RLT-87, RLT-151, RLT-154, RLT-194, RLT-224, RLT-225, RLT-227, RLT-301, RLT-304, RLT-387, RLT-395, and RLT-397.

Against Wilderness Classification: FLT-2, RLT-182, RLT-198, and RLT-278.

Renshaw:
For Wilderness Classification: PLT-1, FPC-1, RLT-1, RLT-2, RLT-11, RLT-12, RLT-21, RLT-26, RLT-27, RLT-32, RLT-33, RLT-34, RLT-36, RLT-54, RLT-56, RLT-65, RLT-66, RLT-72, RLT-74, RLT-92, RLT-151, RLT-154, RLT-160, RLT-193, RLT-197, RLT-226, RLT-231, RLT-235, RLT-237, RLT-271, RLT-280, RLT-284, RLT-298, RLT-301, RLT-302, and RLT-377.

Against Wilderness Classification: RLT-274.

Falls Creek/Silver King:
For Wilderness Classification: PLT-1, RLT-1, RLT-2, RLT-6, RLT-11, RLT-12, RLT-16, RLT-21, RLT-26, RLT-27, RLT-32, RLT-33, RLT-34, RLT-36, RLT-54, RLT-56, RLT-65, RLT-66, RLT-70, RLT-72, RLT-74, RLT-92, RLT-151, RLT-160, RLT-193, RLT-197, RLT-226, RLT-235, RLT-237, RLT-271, RLT-272, RLT-280, RLT-284, RLT-298, RLT-301, RLT-302, and RLT-377.

Against Wilderness Classification: FLT-1, RLT-155, and RLT-274.

Deep Creek:
For Wilderness Classification: FPC-1, RLT-2, RLT-3, RLT-11, RLT-12, RLT-21, RLT-54, RLT-70, RLT-151, RLT-271, RLT-280, RLT-298, RLT-301, RLT-302, RLT-375, and RLT-377.

Against Wilderness Classification: RLT-31 and RLT-274.

Teton Peaks:
For Wilderness Classification: FPC-1, RLT-2, RLT-3, RLT-11, RLT-12, RLT-21, RLT-39, RLT-54, RLT-70, RLT-151, RLT-271, RLT-272, RLT-298, RLT-300, RLT-375, and RLT-377.

Choteau Mountain:
For Wilderness Classification: FPC-1, RLT-2, RLT-11, RLT-12, RLT-54, RLT-70, RLT-280, RLT-298, RLT-301, and RLT-377.

Straight Creek:
For Wilderness Classification: RLT-6, RLT-39, and RLT-54.

Sawtooth:
For Wilderness Classification: RLT-26, RLT-280, and RLT-301.

Benchmark/Elk Creek:
For Wilderness Classification: RLT-26, RLT-271, and RLT-302.

Sun Canyon:
For Wilderness Classification: RLT-151 and RLT-302.

Badger-Two Medicine:
For Wilderness Classification: RLT-3, RLT-21, RLT-24, RLT-149, RLT-182, RLT-227, RLT-298, and RLT-302.

Against Wilderness Classification: RLT-283.

Also see Appendix C for a discussion of responses received by the Helena, Lolo, and Flathead National Forests.

Crazy Mountains:
For Wilderness Classification: RLT-26 and RLT-387.

Also see Appendix C for a discussion of the response received by the Gallatin National Forest.

Middle Fork Judith:
For Wilderness Classification: RLT-14, RLT-17, RLT-87, RLT-156, RLT-280, RLT-312, and RLT-387.

Against Wilderness Classification: FLT-1, RLT-29, and RLT-126.

Big Snowies:
For Wilderness Classification: RLT-17, RLT-27, RLT-156, RLT-280, RLT-311, RLT-312, and RLT-387.

Against Wilderness Classification: FLT-1, FLT-4, RLT-29, RLT-126, RLT-242, RLT-243, RLT-365, and RLT-374.

Tenderfoot/Deep Creek:
For Wilderness Classification: RLT-3, RLT-14, RLT-23, RLT-26, RLT-54, RLT-87, RLT-156, RLT-271, RLT-280, and RLT-387.

Pilgrim Creek:
For Wilderness Classification: RLT-3 and RLT-271.

Supported Alternative "W": RLT-142, RLT-156, RLT-158, RLT-173, RLT-191, RLT-229, RLT-234, RLT-236, RLT-238, RLT-273, RLT-304, and RLT-396.

Supported Governor's Recommendation: RLT-39, RLT-84, RLT-304, and RLT-395.

For Wilderness All Areas: PLT-2.

Comments for wilderness classification - no specific area: RLT-282, RLT-287, RLT-352, and RLT-377.

Comments against wilderness classification - no specific area: RLT-53, RLT-73, RLT-119, RLT-123, RLT-124, RLT-126, RLT-163, RLT-198, RLT-285, RLT-350, and RLT-389.

Response

The Forest has carefully reviewed the roadless land available for wilderness classification. In response to public concern, some changes have been made in the wilderness recommendations on the Rocky Mountain Division. About 5,830 acres in the West Fork of Teton has been added to the Forest's recommendation. Because of right-of-way problems, a slight decrease was made in the Forest's recommendation in the Silver King area. This change will permit the development of trail head facilities on National Forest land near the Dearborn River and provide valuable public access to the Rocky Mountain Division lands. Under the Preferred Alternative-G, part of the Teton, Renshaw, Benchmark/Elk Creek, and Silver King/Falls Creek roadless areas totaling 51,834 acres are recommended to Congress for wilderness classification. If these areas are designated by Congress over 55 percent (436,000 acres) on the Rocky Mountain Division will be classified wilderness.

With the adjacent Forest's recommendation (163,640 acres), the Bob Marshall-Scapegoat-Great Bear Wilderness Complex will exceed 1.7 million acres. The complex encompasses some of the Nations outstanding wildlands including the South Fork of the Flathead, Middle Fork of the Flathead, Swan Crest, Swan Front, Monture, Danaher, Dearborn, South Fork Sun, North Fork of the Sun, and the North Fork of the Teton. The recommendation also provides for other roadless lands on the Rocky Mountain Division (174,466 acres) to be managed for nonwilderness purposes including motorized recreation, developed camping, oil and gas activities, and timber harvest. And, Indian Treaty rights, along with other nonwilderness uses, on 102,100 acres of roadless lands.

Oil and gas potential is only one of many considerations in wilderness recommendations.

The Regional Forester will not make a recommendation on the Deep Creek-Reservoir North Wilderness Study Area until the area's oil and gas potential has been determined.

As part of the Forest planning process, the Regional Forester has recommended nonwilderness for the Middle Fork Judith and the Big Snowies Wilderness Study Areas. Final recommendations on the Middle Fork Judith and Big Snowies Wilderness Study Areas will be made through a separate EIS.

Congress has reserved the right to make final decisions on all wilderness designation. Their decision will be incorporated into the Forest Plan.

Concern-Wilderness Recreation Demand

Some commentators felt the Forest Plan was not meeting the demand for wilderness recreation.

Commentators

PLT-2, RLT-312, and RLT-377.

Response

Wilderness has been reanalyzed and additional information has been added to the final EIS and Forest Plan (see Chapter III, Management Area P, and Appendix U). The future demand for wilderness recreation is based on past use and population projections for Montana. They are the best estimates available and will be monitored. Wilderness recreation opportunities can also be increased through more visitor contact and improved trail maintenance.

Concern-Wilderness Management

One reviewer supported restrictions on the use of pack animals and hunting in wilderness and other areas to provide more solitude for people and wildlife.

Commentators

RLT-15.

Response

Horse and other pack stock use has been an historic use of the Bob Marshall Wilderness complex. About half of the visitors use horses or other pack stock. However, there are restrictions on the number of stock that can be used. The current limit is 35 head of stock per party. The Sun River Game Preserve (almost entirely within the Bob Marshall Wilderness) is closed to hunting. Hunting on other areas is regulated by the Montana Fish and Game Commission.

Also, the Forest Service is currently developing a process for evaluating the amount of physical changes that the agency would accept in the Bob Marshall complex.

WILDLIFE

There was some concern expressed about fish, wildlife, and their habitat. Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 149 (29 percent) commented on some phase of fish and wildlife management.

Concern-Elk

Some commentators expressed a concern with elk, elk habitat, and elk hunting opportunities. The reviewers stated that timber harvest, livestock grazing, roads, and oil and gas activities would impact these values. Some reviewers specifically mentioned maintaining large undisturbed areas and protecting big-game winter range and other key wildlife habitats. They were concerned that increased access and loss of hiding cover would adversely impact the elk habitat, especially in the Jefferson Division.

The State of Montana was concerned with the projected 10 percent decrease in elk hunter opportunity in the Jefferson Division. They felt the decrease was very conservative because it did not include the loss of habitat security that results when roads are built, even if they are later closed to vehicle entry. They also felt that the loss of habitat security from pre-commercial thinning was not considered. They also stated that the Forest provides some of the finest elk hunting in the nation and compromising elk hunting quality for marginal timber values is questionable and should be avoided. Several commentators asked that the projected increase in access be re-evaluated.

Some reviewers, including the State of Montana, expressed concern that elk hunting on the Forest would be entirely on a permit system if the proposed timber harvest/roading level was maintained.

Two commentators wanted all of the findings of the elk-logging study applied. Two commentators suggested that, "hunting related recreation comprises approximately 80 percent of all recreational use of the Lewis and Clark National Forest", therefore, hunting is the highest and major recreation activity on the National Forest.

Several reviewers wanted current elk numbers and hunting opportunities maintained.

Commentators

OCB-12, RLT-23, RLT-151, RLT-241, RLT-273, RLT-279, RLT-292, RLT-293, RLT-297, RLT-301, RLT-311, RLT-375, RLT-388, and RLT-395.

Response

The Forest has reanalyzed elk habitat management. The Forest Plan views elk habitat as a major resource and will maintain the population potential for 8500 elk. In response to public comment, several Management Standards have been added to the final Plan to minimize logging-related impacts on elk. These standards include: a cover analysis for big-game, maintaining effective cover on big-game summer range at 30 percent or greater, and implementing a road management program to maintain big-game habitat capacity.

Research findings from the Montana Cooperative Elk-Logging Study, which had its start on the Lewis and Clark National Forest, are the basis for several management recommendations which were designed to minimize logging-related impacts on elk. This 15-year study found, "Elk responses to road building and logging demonstrated that significant losses in security can be minimized when appropriate restrictions are used by the land manager." The Forest agrees that all of these recommendations should be included in the Forest Plan (see Appendix F, Forest Plan).

The Forest shares the concern of the State with the reduction in elk hunter opportunity and has attempted to mitigate and limit these effects by managing roads, providing adequate cover for elk, and maintaining large areas of undeveloped country. However, continued road construction and timber harvest will result in a slight decrease in elk hunter opportunity. The Forest feels that this reduction (8 percent) is acceptable to maintain the timber program on the Forest. And, that part of this reduction can be off-set by an aggressive road use management program.

The Forest also recognizes that even roads with restricted or closed travel status will continue to impact elk security although to a lesser degree. Because of this fact, the reduction in hunter opportunity included loss from building roads. Loss of security from thinning was also included in the analysis because it is part of the cover removed through timber management practices.

The Forest recognizes the importance of its high quality elk hunting. The proposed timber program will meet the need to provide wood products to local users and communities while continuing to maintain the wildlife resource.

In response to the State of Montana's comment and other public concerns, the Ford Creek Plateau area will be managed for its high wildlife values for elk and big horn sheep.

The Forest has also reanalyzed its road construction program. However, while no significant changes were made on the Jefferson Division, on the Rocky Mountain Division permanent roads will not be built for surface resource management. Of all the National Forests in the Northern Region, the Forest ranks second (behind) as the Forest with the smallest road construction program. Again, we feel this is in keeping with the high wildlife values found throughout the Forest.

The Forest is committed to maintain large undeveloped areas. For example in the Little Belts, about 50 percent of the 798,000 acres will remain undeveloped (397,000 acres). This includes every area identified by the Montana Department of Fish, Wildlife, and Parks as important wildlife security areas, except for the upper part of the Middle Fork of the Judith.

In response to public concern, management in the upper Middle Fork of the Judith has been changed to add emphasis on elk security cover (Management Area C), although timber harvest is still permitted.

In 1984, camping was the most popular activity on the Forest providing 124,700 RVDs of use (18 percent of the total recreation use). Auto travel was the second most popular activity providing 102,300 RVDs of use (15 percent of total recreation use). Hunting ranked third providing 85,100 RVDs of use (12 percent of the total recreation use). Other popular activities included horseback riding 70,400 RVDs (10 percent); hiking 53,900 RVDs (8 percent); snowmobiling 47,700 RVDs (7 percent); gathering forest products 35,300 RVDs (5 percent); fishing 31,400 RVDs (5 percent); downhill skiing 29,900 (5 percent); motorcycling 26,000 RVDs (4 percent); and picnicking 15,200 RVDs (2 percent).

The final Forest Plan maintains the current elk population potential although elk hunter opportunity is reduced by about 8 percent over the 50-year time. This reduction is a result of additional road construction and timber harvest.

Concern-
Grizzly Bear

Several commentators stated a concern for the threatened grizzly bears and their habitat. Reviewers felt timber harvest, grazing, road construction, ORV use, and oil and gas activities could harm grizzly bear habitat. Specific concerns included the proposed wildcat oil and gas well in Hall Creek and roads and timber harvest in the Badger-Two Medicine area. And, the relationship of Forest Service decisions on bears that use Glacier National Park.

The State of Montana felt that it was important that timber management activities in grizzly bear habitat maintain more than a "degree of isolation" (Management Standard E-4) in the Rocky Mountain Division. Where timber values are marginal, management should emphasize security and minimize potential conflicts with humans and grizzly bears. Vehicle access should be limited and occupied areas should be closed to off-road vehicle use. Road construction should be avoided, timber harvest minimized, and existing guidelines strictly enforced.

One reviewer wanted the Forest Service to take a formal position against grizzly bear hunting and request an immediate moratorium on hunting until such time as adequate scientific information exists to support continued hunting. Other commentators opposed hunting grizzly bears. While another reviewer favored continued grizzly bear hunting.

Some reviewers supported wilderness classification, to protect the grizzly bear. Other commentators favored a more aggressive grizzly bear management and protection program. They also felt a need for a better estimate of grizzly bear trends and the need to coordinate management with intermingled private landowners. One commentator supported more habitat improvement.

One commentator felt that if the Forest complies with their management guidelines, that T&E species, especially the grizzly bear, would be protected. However, they also felt that strict adherence to the guidelines would preclude any oil and gas activities or human activities, such as road building, in prime grizzly bear habitat. Some reviewers favored road closures to protect grizzly bear habitat. Another reviewer wanted more on-the-ground effort to protect the bear.

Several reviewers felt that the proposed grizzly bear management is too restrictive for other activities including recreation and oil and gas. And, that expanding grizzly bear populations are a threat to humans. They were also opposed to classifying most of the Rocky Mountain Division as Management Situation 1 for the grizzly bear. These commentators favored Management Situation 2 for most of the Division. One reviewer felt that timber harvest could be a cost-effective vegetative manipulation tool to diversify plant communities to help the grizzly bear.

Commentators

OCB-10, FLT-2, FLT-2-39, FLT-2-60, FLT-2-84, RLT-16, RLT-17, RLT-60, RLT-86, RLT-126, RLT-151, RLT-154, RLT-188, RLT-189, RLT-197, RLT-208, RLT-224, RLT-273, RLT-276, RLT-282, RLT-285, RLT-286, RLT-302, RLT-307, RLT-310, RLT-311, RLT-312 RLT-359, RLT-375, RLT-391, and RLT-395.

Response

The Forest is committed to the recovery of the threatened grizzly bear. Formal consultation with the U.S. Fish and Wildlife Service has been completed and is included in the final Plan. It was their opinion that the revised Forest Plan would not jeopardize the grizzly bear. The Forest has identified occupied grizzly bear habitat (all of the Rocky Mountain Division) according to "The Yellowstone Guidelines." More than 98 percent of the Division is in Management Situation 1 (areas that are essential for the survival of the grizzly). Seasonal ranges have been mapped. Important areas, such as feeding sites and denning areas, are being inventoried (habitat component mapping). In response to public concern, additional information on the grizzly bear has been added to Chapter II, III, and IV of the FEIS.

Management Standards have been strengthened in the final Forest Plan to insure that grizzly bears and their habitat are protected. In response to the comment by the State of Montana and other public concern, the timber program on the Rocky Mountain Division has been reanalyzed and reduced to .5 million board feet. Only nonpermanent roads will be constructed in support of this program. This will help meet local needs for posts, poles, houselogs, firewood, and other wood products. The regulated timber harvest in the Badger-Two Medicine area (Management Area 0) has been eliminated. However, under the 1896 Treaty Agreement with the Blackfeet Indian Tribe, the Blackfeet retained the right to harvest timber. (See Chapter III.) Other

timber areas have been eliminated or reduced. These changes have resulted in a 27,055 acre reduction in the area available for regulated timber harvest on the Rocky Mountain Division. All of these actions will be beneficial to the grizzly bear.

The Forest feels that most other activities can be carried out without adversely affecting the grizzly bear, as long as the identified mitigation measures are used.

A major Interagency effort is underway on the Rocky Mountain Front to complete habitat component mapping, and develop a computerized model to analyze the cumulative effects of all activities on the grizzly bear and its habitat (see Appendix L, Forest Plan).

This cumulative effects model will be patterned after one developed for the Yellowstone Grizzly Bear Ecosystem. Three sub-models will be developed to address grizzly bear habitat quality, habitat effectiveness related to human activities, and the risk of human caused grizzly bear mortality.

From this effort, Area Coordination Analysis will be completed for the six bear management units that have been identified on the Rocky Mountain Front. A Bear Management Unit is an area of land which is ecologically similar and includes all yearlong habitat requirements for a subpopulation of adult female grizzly bears. Area Coordination Analysis coordinates the various activities that are proposed (both surface and subsurface) in time and space to minimize the large scale influences on grizzly bears and their habitats.

Any planned activity found to create a jeopardy situation would be modified to eliminate the conditions causing the jeopardy situation. If modification did not rectify the jeopardy situation, the activity will not be permitted. If critical areas are identified through this analysis, surface occupancy will not be permitted.

The Forest recognizes that the grizzly bear needs large expanses of undeveloped land. On the Rocky Mountain Front, the grizzly bear is equally dependent on low elevation, transitional type lands (including BLM, State, and private lands). These lands provide the very important spring habitat along the eastern edge of the Front. Some bears also use this habitat yearlong.

Monitoring of oil and gas and other activities on grizzly bears and their habitat is a continuing program on the Rocky Mountain Front. The Forest feels that by allowing oil and gas activities on important habitat only during noncritical time periods and by limiting these activities in time and space, that oil and gas activities can be carried out without adversely affecting the grizzly bear. The Forest feels continual monitoring will ensure that ongoing activities will not detract from the recovery of the grizzly bear. Additional established procedures including consultation with the U.S. Fish and Wildlife (see Appendix L, Forest Plan) will also ensure that the grizzly bear and its habitat will not be adversely affected.

The standards for timber harvest in grizzly bear habitat do maintain more than a "degree of isolation". Regulated timber harvest activities on the Rocky Mountain Division will affect only about 3 percent of the Division (Management Area 0). The Forest recognizes the effect of road construction and timber harvest activities on grizzly bears and their habitat. The Forest Plan proposes several standards to minimize this effect by maintaining security habitat and reducing the interface with humans.

Most all new roads will be closed to public use. (Many old roads are also being closed or restricted to use during important wildlife use periods.)

The Montana Fish and Game Commission regulates hunting of grizzly bears in the Rob Marshall Wilderness ecosystem. The State Department of Fish, Wildlife, and Parks is currently analyzing this program. The Forest feels that this is appropriate forum for the Forest Service to comment on the hunting of grizzly bears.

Grizzly bears have been studied on the Rocky Mountain Front since 1977. From these studies, better trend information is being developed. Interagency efforts to coordinate grizzly bear and other wildlife studies started in 1980. The habitat improvement program for grizzly bears has been reviewed and increased to 100 acres yearly.

The Forest feels with appropriate timing and spacing practices, opportunities for activities such as oil and gas exploration, and recreation can be authorized while meeting grizzly bear direction.

The Forest Service is making a strong effort to educate the public in ways to avoid confrontation with grizzly bears.

The Forest feels that Management Situation 1 is the appropriate classification for most all of the occupied lands on the Rocky Mountain Division. The Forest recognizes that under some conditions, timber harvest can increase the forage used by grizzly bears. However special measures, as authorized by the Forest-Wide Management Standards are necessary to insure that the grizzly bear habitat is not adversely affected.

Concern-
Gray Wolf

Some commentators expressed a concern with the endangered gray wolf. Reviewers thought that more protection and direction for wolf management should be given. They also expressed a concern with additional need to identify critical wolf habitat. Other reviewers felt there were no wolves in the area and therefore development projects should be authorized. One commentator felt that the beneficial effects of timber management would also prove beneficial to wolves, if conflicts with humans is minimized through a vigorous road management program.

Commentators

FTL-2-60, RLT-19, RLT-126, RLT-188, RLT-193, RLT-286, RLT-302, RKT-310, and RLT-359.

Response

Formal consultation with the U.S. Fish and Wildlife Service has been completed and is included in the Forest Plan and final EIS. It was their opinion that implementation of the revised Forest Plan would not jeopardize the gray wolf. Recovery of the endangered gray wolf population is linked to the Forest's management of grizzly bear habitat. The Forest Plan also calls for maintaining a suitable prey base and habitat for the gray wolf. Habitat capacity for 10 wolves would be provided under all alternatives. In response to public concern, additional information on the gray wolf has been added to Chapters II, III, and IV of the FEIS. Also, additional requirements have been added to Management Standard C-2, Threatened and Endangered Species, in the final Plan to enhance the recovery of the gray wolf.

Concern-
Threatened and
Endangered Species

Some commentators supported the recovery of endangered species. These reviewers opposed any increase in open roads and oil and gas activities which might effect T&E species or their habitat. Other reviewers view any development as contrary to the protection of T&E species. One commentator

felt that the Plan did not state what actions would be taken when monitoring and cumulative effects analysis indicates unsatisfactory conditions or events. They also felt the Plan made no commitment for the continued funding of these programs and that there was no clear statement of how listed species will be protected. One reviewer wanted oil and gas exploration curtailed until the Forest can demonstrate that these activities are beneficial to T&E species. Other reviewers wanted oil and gas activities, timber harvest, and road construction activities suspended in the Badger-Two Medicine area until the grizzly is recovered. Still other reviewers questioned the Forest Service's ability to control access into the Badger-Two Medicine area, because of the Blackfeet Indian Treaty Rights.

Commentators

FLT-3, RLT-149, RLT-158, RLT-191, RLT-192, RLT-194, RLT-240, RLT-271, RLT-288, RLT-301, RLT-302, RLT-312, and RLT-375.

Response

Formal consultation with the U.S. Fish and Wildlife has been completed and is included in the Forest Plan as Appendix D. It was their opinion that implementation of the revised Forest Plan would not jeopardize T&E species. In response to public concerns, Management Standard C-2, Threatened and Endangered Species, in the final Forest Plan has been strengthened to ensure compliance with the Endangered Species Act. The Forest shares the concern of the effect of road construction, oil and gas, and other activities on T&E species and their habitat. Efforts are underway to increase the Forest analytical ability to assess these activities (see Grizzly Bears, this section). Any planned activity found to create a jeopardy situation would be modified so the jeopardy situation would be eliminated or the activity would not be permitted. The Forest Service is committed to maintain the necessary funding levels for these programs (see Forest Plan, Appendix H). The Forest feels that proposed activities are in compliance with the Endangered Species Act, and therefore should not be suspended. The regulated timber harvest in the Badger-Two Medicine area (Management Area O) has been eliminated. While the Blackfeet Indians have retained certain rights in the Badger-Two Medicine area, we feel the road use can be controlled to protect the grizzly bear. The Forest is working with the Blackfeet Indian Tribe on a road use-access agreement, which supports this contention (see Public Comment-DEIS-Wildlife, this chapter).

The Forest Service is making a strong effort to educate the public in ways to avoid confrontation with grizzly bears.

The Forest feels that Management Situation 1 is the appropriate classification for most all of the occupied lands on the Rocky Mountain Division. The Forest recognizes that under some conditions, timber harvest can increase the forage used by grizzly bears. However special measures, as authorized by the Forest-Wide Management Standards are necessary to insure that the grizzly bear habitat is not adversely affected.

Concern-
Gray Wolf

Some commentators expressed a concern with the endangered gray wolf. Reviewers thought that more protection and direction for wolf management should be given. They also expressed a concern with additional need to identify critical wolf habitat. Other reviewers felt there were no wolves in the area and therefore development projects should be authorized. One commentator felt that the beneficial effects of timber management would also prove beneficial to wolves, if conflicts with humans is minimized through a vigorous road management program.

Commentators

FTL-2-60, RLT-19, RLT-126, RLT-188, RLT-193, RLT-286, RLT-302, RKT-310, and RLT-359.

Response

Formal consultation with the U.S. Fish and Wildlife Service has been completed and is included in the Forest Plan and final EIS. It was their opinion that implementation of the revised Forest Plan would not jeopardize the gray wolf. Recovery of the endangered gray wolf population is linked to the Forest's management of grizzly bear habitat. The Forest Plan also calls for maintaining a suitable prey base and habitat for the gray wolf. Habitat capacity for 10 wolves would be provided under all alternatives. In response to public concern, additional information on the gray wolf has been added to Chapters II, III, and IV of the FEIS. Also, additional requirements have been added to Management Standard C-2, Threatened and Endangered Species, in the final Plan to enhance the recovery of the gray wolf.

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Endangered Species

Some commentators supported the recovery of endangered species. These reviewers opposed any increase in open roads and oil and gas activities which might effect T&E species or their habitat. Other reviewers view any development as contrary to the protection of T&E species. One commentator

felt that the Plan did not state what actions would be taken when monitoring and cumulative effects analysis indicates unsatisfactory conditions or events. They also felt the Plan made no commitment for the continued funding of these programs and that there was no clear statement of how listed species will be protected. One reviewer wanted oil and gas exploration curtailed until the Forest can demonstrate that these activities are beneficial to T&E species. Other reviewers wanted oil and gas activities, timber harvest, and road construction activities suspended in the Badger-Two Medicine area until the grizzly is recovered. Still other reviewers questioned the Forest Service's ability to control access into the Badger-Two Medicine area, because of the Blackfeet Indian Treaty Rights.

Commentators

FLT-3, RLT-149, RLT-158, RLT-191, RLT-192, RLT-194, RLT-240, RLT-271, RLT-288, RLT-301, RLT-302, RLT-312, and RLT-375.

Response

Formal consultation with the U.S. Fish and Wildlife has been completed and is included in the Forest Plan as Appendix D. It was their opinion that implementation of the revised Forest Plan would not jeopardize T&E species. In response to public concerns, Management Standard C-2, Threatened and Endangered Species, in the final Forest Plan has been strengthened to ensure compliance with the Endangered Species Act. The Forest shares the concern of the effect of road construction, oil and gas, and other activities on T&E species and their habitat. Efforts are underway to increase the Forest analytical ability to assess these activities (see Grizzly Bears, this section). Any planned activity found to create a jeopardy situation would be modified so the jeopardy situation would be eliminated or the activity would not be permitted. The Forest Service is committed to maintain the necessary funding levels for these programs (see Forest Plan, Appendix H). The Forest feels that proposed activities are in compliance with the Endangered Species Act, and therefore should not be suspended. The regulated timber harvest in the Badger-Two Medicine area (Management Area 0) has been eliminated. While the Blackfeet Indians have retained certain rights in the Badger-Two Medicine area, we feel the road use can be controlled to protect the grizzly bear. The Forest is working with the Blackfeet Indian Tribe on a road use-access agreement, which supports this contention (see Public Comment-DEIS-Wildlife, this chapter).

Concern-
Wildlife Habitat

Some commentators expressed a concern with the wildlife resource and wildlife habitat management, especially on the Rocky Mountain Division. A few reviewers questioned the effect of timber, oil and gas activities and roads, on wildlife habitat, and how wildlife habitat would be protected under these activities. Some reviewers wanted the cumulative effects on wildlife analyzed. Others thought that wildlife values did not receive equal emphasis with proposed timber sales. Two reviewers were doubtful that timber harvest would improve wildlife habitat.

The State of Montana favored wildlife cover and security over forage production. They also supported minimum vehicle access and ORV use in wildlife management areas.

Some reviewers supported additional wildlife management areas and increased wildlife habitat improvement. One reviewer pointed out that brush piles from timber harvest and road construction provide cover and feed for deer. One commentator favored guidelines that prevented roads, ORVs, and mineral exploration in important wildlife areas. While another felt that when done properly, logging could be a valuable asset in opening areas for wildlife and at the same time collect revenues.

Commentators

RLT-93, RLT-142, RLT-144, RLT-151, RLT-156, RLT-187, RLT-192, RLT-229, RLT-232, RLT-237, RLT-239, RLT-241, RLT-275, RLT-280, RLT-304, RLT-375, RLT-387, and RLT-395.

Response

The Forest has reanalyzed wildlife habitat management. The Forest Plan promotes high quality wildlife and fish habitat. Over 65 percent of the Forest will be managed for wilderness, semi-primitive recreation, and wildlife values. About 30 percent will be roaded and developed mainly for their timber resource. In response to the State's and other public concern, Management Area C has been expanded to include another 15,000 acres, which have been identified as important elk habitat including the Harrison drainage in the Middle Fork Judith. Management Area I, which protects elk migration routes, has also been expanded to include another 8,000 acres including the Ford Creek Plateau area. The timber program on the Rocky Mountain Division has been reduced to .5 million board feet yearly. Individual timber sales are reviewed by a wildlife biologist and recommendations are made on a case-by-case basis.

The management standard for Wildlife Coordination, C-1, has been strengthened. The EIS analyzes the effects of various activities on the wildlife resource. Additional information has also been provided on the effect of the proposed activities on the wildlife resource (see Chapter IV).

The balance between wildlife cover and security over forage production must be made on a case-by-case basis. Many times forage production can be increased through prescribed burning without adversely affecting cover and security for wildlife. Incompatible ORV use will be restricted in important wildlife areas. Road construction will also be reduced.

Concern-
Fish and Fish Habitat

A few reviewers discussed the importance of fish and fish habitat, especially on the Rocky Mountain Division. One reviewer supported the fish habitat standards, but was concerned with the effects of increased sedimentation on the North Fork of the Musselshell. Other commentators also expressed a concern with protection of Upper Missouri River Cutthroat and its habitat with the proposed increases in grazing and logging. One reviewer felt that commodity production should not be allowed to proceed until the proposed mitigation measures are proven effective and reliable, to eliminate any possibility of irreparable damage to the fishing resource. They also felt that fisheries was not given equal consideration in the Forest Plan. They felt that the Plan must take into account the effects the proposed increase in timber harvest will have on fish populations. Other commentators wanted more information on the fisheries resource of the Forest and supported more fish habitat improvement.

The State of Montana wanted the fisheries evaluated by individual watershed. Along with other commentators, the State felt that no attempt was made to address the effects of activities on downstream fisheries. The State wanted the distribution of the Missouri River Cutthroat to be determined and mapped and management activities designed to prevent any degration or loss of habitat. They felt the Plan was vague about specific fish habitat improvement practices.

Commentators

RLT-118, RLT-229, RLT-240, RLT-241, RLT-311, RLT-312, RLT-387, and RLT-395.

Response

The Forest has reanalyzed fish habitat management. The Forest Plan recognizes the importance of fish and fish habitat and will maintain the population potential for 202,000 trout. Management Standard F-3, Fish Habitat, sets the standards for coordinating fish habitat with other resources, coordinating the Forest annual program of work with the Montana Department of Fish, Wildlife, and Parks, designing and scheduling fish habitat surveys and studies to improve the fisheries resource, and emphasizing the maintenance or enhancement of habitat supporting populations of Upper Missouri River (blackspotted) Cutthroat Trout. The management of soil and vegetation in riparian areas is essential to fish habitat management (see response on riparian areas on the next page). The Forest feels these standards provide the guidance necessary to protect fish habitat, including the habitat of the Upper Missouri River Cutthroat Trout. In response to public concern, additional fish habitat improvement has been provided in the final Plan.

Grazing has taken place on the Forest since before the turn of the century. Timber has been harvested on a regulated basis for over 40 years. The Forest is recognized for its fisheries resource. The Forest feels the standard in the Forest Plan are proven measures which will maintain the fisheries resource. The effect of the timber program on the fisheries resource is discussed in Chapter IV.

In response to concern regarding sedimentation, increases in sediment have been calculated for the major drainages which will be affected by road construction and timber (see Public Comment-DEIS-Soil and Water, this chapter).

Also, additional information on the effects of activities on downstream fisheries has been provided (see Chapter IV).

The Forest Service has the responsibility for managing wildlife and fish habitat, and the Montana Department of Fish, Wildlife, and Parks has the responsibility for managing the actual wildlife and fish populations. The Forest feels the mapping and distribution of Missouri River Cutthroat is a State responsibility, but we will be glad to assist in this effort.

A 5-Year Wildlife Habitat Improvement Program has been added to the Forest Plan (Appendix M). This program contains specific fish habitat improvement practices.

Concern-Riparian Areas	Some reviewers stated the importance of riparian area management for wildlife and fish habitat. Reviewers supported full riparian habitat protection with no timber harvest. Two reviewers were concerned with the statement "Adjacent management areas will dictate the type of activity." While other commentators were concerned with the use of 100 feet from the edge of perennial streams or other water bodies while describing riparian areas. One commentator also wanted intermittent streams protected. One reviewer pointed out that there are ways to benefit riparian areas through fuel and timber removal.
Commentators	RLT-20, RLT-118, RLT-142, RLT-144, RLT-149, RLT-168, RLT-191, RLT-194, RLT-229, RLT-232, RLT-234, RLT-239, RLT-396, and RLT-387.
Response	The Forest Plan recognizes the importance of riparian area management for wildlife. Management Area R, sets the overall management direction for riparian areas. Management Standards for Riparian Area, Soil, and Water Protection in Range Management (D-3); Timber Harvest (E-4); Soil, Water, and Air Protection (F-3); Seismic Exploration (G-1); Oil and Gas Leasing, Exploratory Drilling, Field Development, and Production (G-2); Maintenance and Construction of Roads, Trails, and Other Facilities (L-4); and Debris Control (P-2) set the standard for coordinating these activities with riparian area management. The statement, "Adjacent management area will dictate the type of activity", means that the recreation setting, visual quality objective, and trail and road management will be managed to be compatible with adjacent management areas. In response to public concern, the use of "100 feet from..." has been deleted in the final Plan. The Forest recognizes that properly done, timber harvest can help maintain riparian values.

RANGE

Concern-
Grazing Level

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 22 (4 percent) commented on the grazing level or noxious weed program.

Some commentators expressed an opinion on the grazing level. Eleven reviewers recommended less grazing because of the need to protect wildlife habitat (especially elk, winter range), fish, dispersed recreation opportunity, riparian areas, soils, and water quality. Three reviewers recommended continuation of current grazing levels.

The State of Montana supported the planned increase in grazing, while three commentators wanted increased forage production for livestock. One commentator supported the elimination of sheep grazing on the Rocky Mountain Division. The State also felt the stocking rates, livestock distribution, duration of grazing, and season of use should be adjusted to achieve the goal of good to excellent condition on allotments that are in very poor, poor or fair condition, e.g., the Highwoods. One reviewer questioned increasing the grazing level without completing the allotment management planning. And, that stocking levels should be based on "worst year" conditions.

Commentators

Less Grazing: PLT-3, RLT-54, RLT-55, RLT-93, RLT-119, RLT-154, RLT-229, RLT-232, RLT-276, RLT-375, and RLT-387.

Current Grazing Level: RLT-119, RLT-231, and RLT-375.

Proposed Grazing Level: RLT-395.

More Grazing: RLT-172, RLT-285, and RLT-364.

Response

The Forest has reviewed the proposed increase in grazing (about 3 percent over 50 years) and feels that, considering other resource values, the increase is appropriate. Any actual changes in the grazing level must be supported by range allotment analysis which considers the items identified by the State.

The goal to achieve good to excellent range condition by 2030 is being pursued. For example, a management plan has recently been completed in the Highwoods. Adjustments were made in the season of use and range improvements were scheduled to improve cattle distribution and forage production. About 1 percent of suitable range in this allotment is classified as excellent, 87 percent good, 12 percent fair, 0 percent poor, and 0 percent very poor. Stocking levels are based on average yearly conditions. Adjustment can be made if range conditions warrant it.

Concern-
Noxious Weed

Some commentators commented on noxious weeds and the Forest program to control them. Most commentators felt the Forest should increase its program and extend more cooperation to local Weed Districts.

The State of Montana encouraged the use of an integrated pest management approach and monitoring for noxious weeds on the entire Forest. They also felt standards for pack stock feed should be developed to prevent the spread of noxious weeds into wildernesses. Other commentators were concerned with the spread of noxious weeds with new road construction. One reviewer felt the Plan should adopt protective measures to minimize ecological damage from weed control.

Commentators

RLT-10, RLT-39, RLT-131, RLT-172, RLT-225, RLT-312, RLT-364, RLT-375, RLT-385, and RLT-395.

Response

The Forest is committed to take a leadership role in the control of noxious weeds on National Forest and intermingled lands. Recently funding has been substantially increased to deal with this serious problem. In response to public concern, additional information on noxious weeds has been added to both the FEIS (Chapter III) and the final Forest Plan (Chapter VI).

The Forest is using an integrated pest management approach for controlling noxious weeds (see Management Standard D-2). Special attention is given to sensitive nontarget habitat which may be adversely affected by application of herbicides. The Forest agrees and the requirements have been changed to monitor noxious weed invasions throughout the Forest, not just sensitive areas.

The Forest encourages the use of weed free hay for pack stock. However, a requirement for weed free hay would be very difficult and expensive to administer (see Forest Plan, Management Area P).

The Forest recognizes the problem with new road construction and ground disturbing activities. Standards have been set to require re-establishment of vegetation as soon as practicable (see Management Standard F-3, Soil, Air, and Water Protection).

The Forest is equally committed to minimize the ecological disturbance of weed control. The use of herbicides is reviewed annually, for opportunities to replace herbicides with other effective integrated pest management methods.

TIMBER

Concern-
Amount of Timber

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 141 (26 percent) commented on timber allocation or management.

Numerous reviewers commented about the amount of timber harvested. Comments varied from decreasing the proposed amount to increasing the proposed amount.

Of those desiring an increase in harvest levels, major reasons include jobs, taxes, community stability, and an adequate supply of raw material for the local mills.

The reviewers stated that the local logging industry will not survive without an increase, especially during the first decade. They felt private timber supplies are decreasing and the demand for National Forest timber will increase in the next 5-10 years. Some reviewers including local timber purchasers felt a timber harvest level of 20 million board feet was needed during the first decade. They also pointed out the closure of the mill at White Sulphur Springs was a result of not having enough timber to process. Three reviewers objected to including tenative suitable forest lands in any land category that prohibits or severely restricts timber harvest. They also felt the Forest Service has a responsibility to promote timber management.

Some commentators felt the Forest would become a fire hazard unless managed on a sustained yield basis. Others thought the harvest level should be increased to prevent loss to insects and disease. Reviewers thought too much emphasis was placed on wilderness, semi-primitive recreation, and wildlife values.

One reviewer felt the Forest Service counted votes of those favoring non-management of the timber resource. Reviewers were also concerned that 4 million board feet of the current program was posts, poles, and other products. One reviewer supported more small sales. One reviewer felt it was better to maintain the largest suitable timber base, and speed the impact of timber harvest to reduce the impacts on wildlife, water, and fisheries. Two commentators felt the Proposed Plan did not recognize several timber management opportunities on the Rocky Mountain Division.

Of those desiring a decrease in harvest levels: recreation; wildlife (especially elk); soil erosion and water quality; air quality; and, fish (related to water quality).

Wildlife concerns, including T&E species, were expressed on the Rocky Mountain Division of the Forest. Water quality concerns often were related to steep slopes. The State of Montana felt a harvest level exceeding 5-6 million board feet annually in the Jefferson Division might reduce hunter opportunity and require a permit system for all elk hunting.

Commentators

Increase proposed level of harvest: FLT-2, FPC-2, RLT-18, RLT-20, RLT-23, RLT-35, RLT-60, RLT-71, RLT-89, RLT-115, RLT-119, RLT-121, RLT-123, RLT-126, RLT-159, RLT-171, RLT-187, RLT-199, RLT-223, RLT-230, RLT-233, RLT-285, RLT-286, RLT-364, RLT-371, and RLT-389.

Agree with proposed level: PLT-1, RLT-27, RLT-39, and RLT-375.

Decrease proposed harvest: RLT-38, RLT-54, RLT-55, RLT-70, RLT-82, RLT-226, RLT-235, RLT-236, RLT-239, RLT-295, RLT-311, RLT-312, and RLT-395.

Response

The Forest carefully reviewed the proposed level of timber harvest in relationship to the supply potential, demand, effects on other resources, and net public benefit. In response to public concern, some changes in the timber program have been made. Timber management will be practiced on 282,307 acres of suitable land in the final Forest Plan, 15 percent of the total Forest acreage. A 14 million board feet sale program will continue for the first 10 years....and will increase to 20 million board feet by the third decade of the Plan. Most of the timber will be harvested from the Jefferson Division. Although the total harvest on the Jefferson Division has not been changed from the Revised Proposed Plan, the scheduling has been adjusted so that an additional 1.5 million board feet will be available yearly for harvest during the first decade of the Plan. The Forest has reviewed the allocation for tentatively suitable lands and feels they are correct. The Forest also feels that they are promoting sound timber management practices on these tentatively suitable acres.

The Forest realizes they are not meeting the local timber industry demand for timber. However, when reviewed with other landownerships, other National Forests that provide sawlog materials, and with other resource values, the Forest feels the timber program provides a fair share of this demand while maintaining important wildlife and semi-primitive recreation values.

Sawmills at Judith Gap, Townsend, Livingston, and Lewistown have an annual one-shift, production capacity of about 50 million board feet. Currently the Forest supplies about 25 percent of this production capacity. By the year 2005 the Forest will be supplying 40 percent. The Forest contains about 40 percent of the areas commercial forest land within reasonable milling distance. Therefore, the sawmills must continue to rely on private lands, State, and other Federal lands for much of their supply.

The Forest is confident that the timber level can be increased while maintaining wildlife, and protecting soil and water quality. This balanced timber supply base will provide the greatest net public benefit for the management of the Lewis and Clark National Forest.

The Forest Plan maintains the current potential for elk population. However, elk populations are largely controlled by the State of Montana through hunting seasons. The Forest Plan recognizes there will be a 8 percent decrease in elk hunting opportunities.

Concern-Specific Areas

Many commentators were against timber harvest in particular areas with a few comments favoring timber harvest in certain areas.

Many reviewers were against harvesting timber on the Rocky Mountain Division. Reasons stated were high wildland, wildlife, and watershed values. Some wanted an EIS done on each individual sale. Others wanted timber harvest limited to developed areas. One reviewer pointed out the additional cost of harvesting timber on the Division because of the special requirements. The State of Montana questioned sacrificing other resource values to obtain minimum timber values. The State also felt that the disturbance from timber harvest compounded with the potential oil and gas development should be clearly documented.

Commentators

PLT-1, RLT-20, RLT-21, RLT-149, RLT-191, RLT-281, RLT-304, RLT-312, RLT-373, RLT-395, and RLT-396.

Areas specifically mentioned on the Rocky Mountain Division were:

Badger-Two Medicine:
RLT-21, RLT-140, RLT-144, RLT-151, RLT-276, RLT-375, and RLT-395.

Benchmark-Willow:
RLT-144 and RLT-395.

Elk Creek-Baily Basin:
RLT-395.

Teton:
RLT-304.

Falls Creek:
RLT-58.

Renshaw:
RLT-304.

Olney Creek:
PLT-1, RLT-27, RLT-40, RLT-300, and RLT-375.

Petty Creek:
RLT-144 and RLT-395.

In the Jefferson Division, opposition to timber harvest levels and specific site centered around wildlife values, especially elk. The State of Montana felt a harvest level exceeding 5-6 million board feet annually would reduce hunter opportunity and force the State to use permits for all elk hunting in the Jefferson Division. Others wanted the harvest level in the Little Belts decreased.

RLT-311 and RLT-395.

Areas specifically mentioned in the Jefferson Division were:

Kings Hill:
RLT-144.

Middle Fork Judith:
RLT-199.

Harrison Creek:
RLT-55.

Deadhorse Timber Sale:
RLT-144, RLT-241, and RLT-275.

Running Wolf Sale:
RLT-144 and RLT-241.

Central Park Timber Sale:
RLT-40.

Placer/Snow Timber Sale:
PLT-1, RLT-27, and RLT-40.

Tenderfoot/Deep Creek Timber Sale:
RLT-23.

Wood Mountain Timber Sale:
PLT-1, RLT-27, and RLT-40.

Big Snowies:
RLT-199.

North Fork Musselshell Timber Sale:
RLT-144 and RLT-241.

Yogo Timber Sale:
RLT-144, RLT-241, and RLT-275.

Mizpah Timber Sale:
RLT-144 and RLT-275.

East Fork Spring Creek Timber Sale:
RLT-144 and RLT-275.

Comb Creek Timber Sale:
RLT-144 and RLT-275.

Mill-Lion Timber Sale:
RLT-144, RLT-241, and RLT-275.

Lower Sage Timber Sale:
RLT-144, RLT-241, and RLT-275.

Ettien Ridge Timber Sale:
RLT-144.

Hoover Springs Timber Sale:
RLT-144.

Loco Grouse:
RLT-144.

Target Rock:
RLT-144.

Little Snowies:
RLT-144.

Response

Each area was reviewed by the planning and management teams to determine if timber harvest was an appropriate land use.

On the Rocky Mountain Division, in response to public concern, the timber program has been reduced to .5 million board feet (from 1.0 million board feet). The harvest of post, poles, firewood, and houselogs will be emphasized. Only short, nonpermanent roads will be constructed in support of this program. After the wood products have been removed, these roads would be permanently closed and the surface entirely revegetated. In response to the Blackfeet Indian Tribe, the State, and other public concern, the regulated timber harvest in the Badger-Two Medicine area has been eliminated. However, under the 1896 Treaty Agreement, the Blackfeet Indian Tribe (see Chapter III) retained the right to harvest timber for agency and domestic purposes. Olney Creek has also been removed from the timber harvest program.

On the Jefferson Division, the timber program was increased slightly. However, no significant changes were made in any area (see Management Area, this chapter). While the Forest feels that elk habitat will be maintained for the current population level, the State will have to determine if and when permit elk hunting in the Little Belts is necessary.

Concern-
Low Productivity

Some commentators questioned that with the Forest's low timber productivity why there was a need to increase the timber harvest level.

Commentators

RLT-65, RLT-143, RLT-153, RLT-157, RLT-160, RLT-239, RLT-289, and RLT-311.

Response

The timber productivity for the Lewis and Clark National Forest is about average for an eastside Montana Forest. Timber has been harvested on a regulated basis for over 40 years. This program not only provides jobs, taxes, and community stability, but also helps maintain a healthy forest through age class and vegetative diversity.

Concern-Demand

Three commentators questioned if there will be a market for additional timber harvest. While one reviewer questioned whether the Forest Service should assume responsibility for supplying timber volumes formerly produced from private lands.

Commentators

RLT-36, RLT-154, RLT-232, and RLT-375.

Response

Since 1980, the Forest has sold most of its advertised timber sales. There has been a continued demand for wood products, and the local timber industry has asked for additional sawlogs. The Forest feels that the timber program is important to both the Forest and local communities, and we are committed to provide a fair share of this program. The Forest contains about 40 percent of the areas commercial forest lands and will provide about 40 percent of their timber needs.

Concern-Clearcutting

Four commentators commented about clearcutting. Some were against clearcutting altogether, while others wanted clearcutting used when it was the appropriate silvicultural system.

Commentators

RLT-23, RLT-54, RLT-239, and RLT-294.

Response

Additional information on even-aged management has been added to the final EIS. Clearcutting is only used where it is the optimum silvicultural system. Optimum is considered to be the situation where no other silvicultural system is an alternative to clearcutting. (See Northern Regional Guide and Forest Plan, Appendix A.) Clearcutting insures the perpetuation of certain tree species and permits orderly salvage in dead and dying areas. It often provides the only effective means of combating destructive forest enemies, such as insects and disease. Clearcutting is a sound and practical way of bringing mature and overmature lodgepole pine forests under management. About 50 percent of the Forest is in the lodgepole pine type. Appropriate silvicultural systems for the Lewis and Clark National Forest have been added to Appendix A of the final Plan.

Concern-Firewood

Three commentators were concerned about firewood cutting. One commentator wanted more management time and dollars spent on the program. The individual felt that all timber sales must include provisions for retrieval of firewood. One reviewer wanted any roads used for other programs to also be used to harvest firewood. The State of Montana felt there should be more flexibility for firewood. And that road closures be evaluated on a case-by-case basis.

Commentators

RLT-10, RLT-35, and RLT-395.

Response

Additional information on the impacts of firewood cutting has been added to the final EIS. Management Standard E-2, Firewood Administration and Utilization, has been reviewed, but no substantial changes were made. The Forest will continue to supply firewood for home and commercial use. Permits will be required for all firewood cutting as directed by National Policy. Free use will continue in designated areas of excessive deadwood, such as slash piles. Dead trees used by wildlife will be protected. All new roads will be evaluated to determine if leaving them open is appropriate so that firewood can be used. The Forest is increasing its effort in managing the firewood program. Standards have been set to ensure other resources are protected when gathering firewood (Management Standard E-2, Forest Plan).

Firewood has become one of the more sought after commodities in this area. By providing a portion of the total timber program as firewood, the Forest is responding to this multiple-use need. Firewood can be harvested with a minimum impact to the timber industry by meeting this need with the dead and down material and by logging slash after timber harvest. And, by providing green firewood areas where the timber is not of sawlog size, such as in stagnated stands or stands that need to be thinned.

Concern-
Reforestation

The State of Montana felt that reforestation should be based on economic analysis and that some artifical regeneration may be warranted. They also felt that if regeneration is poor on certain sites, that the option of not harvesting timber should be considered. One reviewer was concerned that the Forest Plan did not show the 10 acre clearcut on the Rocky Mountain Division as being reseeded and therefore erosion will be a problem.

Commentators

RLT-150 and RLT-395.

Response

Natural regeneration has little cost associated with it, while planting costs average about $300/acre. Based on economics, planting cannot be justified when an area will regenerate naturally. Over 283,000 acres of Forest land has been removed because it is not capable of producing crops of industrial wood (see Appendix A, Forest Plan). The key to assuring regeneration on other areas is using the proper silvicultural method (i.e. not clearcutting any dry Douglas fir sites). All disturbed sites such as roads, landings, and skid trails, will be seeded, however when trying to

re-establish a timber crop, grass can compete with tree seedings. Natural revegetation usually reduces any significant erosion on these areas.

Concern-Silvicultural

The State of Montana felt that selective cuts and uneven-aged management should be considered for ponderosa pine and wildlife management areas. And, that ponderosa pine is a shade-intolerent species and cannot be managed effectively under an even-aged regime. Sanitation and salvage operations should be limited on noncommercial forest and areas where timber values are not high.

They also felt consideration should be given to manage regrowth on a much shorter rotation to reduce the continual demand for old-growth timber. This would promote efficient use of more productive forest land and reduce the need for the expanded road system.

Commentators

RLT-395.

Response

The Forest has reviewed the proposed even-aged management on ponderosa pine and wildlife management area, and feels that it is the appropriate method where applied. Ponderosa pine, a seral species, has been managed successfully in the Little Snowy Mountains under an even-aged system for over 30 years. Uneven-aged management will favor plant succession toward Douglas fir, which is the major climax species in the Little Snowies. The objective in using even-aged management is to retain ponderosa pine as a major component in these stands. Uneven-aged management is appropriate for some wildlife areas, such as riparian areas. Selection harvest is also appropriate under the Rocky Mountain Division timber program.

Sanitation and salvage operations are not planned on noncommercial forest land.

The NFMA is very specific on when a timber stand may be harvested, "The stand will have generally have reached the culmination of mean annual increment." Exceptions to this standard are permitted for the use of sound silvicultural practices, such as thinning or other stand improvement measures; for salvage or sanitation harvesting of timber stands which are substantially damaged by fire, windthrow, or other catastrophe, or which are in imminent danger from insect and disease attack;

for experimental and resource purposes; or for removing a particular species of trees. Increase silvicultural practices, to increase timber production, such as thinning, are not cost-efficient.

Concern-Timber & Other Values

One reviewer questioned if managing vast areas for elk and semi-primitive recreation benefited the greatest number of people. Other commentators felt that existing wilderness and noncommercial forest land provides adequate opportunities for quality hunting in an unroaded environment. These commentators felt that road closures could be used with a minimum road system without removing productive lands from the timber base. The reviewers felt more timber could be harvested in riparian areas and timber harvest could be used to improve winter range, grizzly bear, and other wildlife and grazing habitat, rather than prescribed fire. One reviewer pointed out that timber harvest can produce transitory vegetation and does not always have a negative impact on forage values.

Commentators

RLT-20, RLT-89, RLT-126, RLT-157, and RLT-159.

Response

The slight increase in the timber harvest level in the Jefferson Division was made after careful review of the effects on wildlife and recreation values, and consideration of the economic values. We agree, while there are some opportunities to use timber harvest to improve wildlife habitat and forage production, a major concern of the Forest are they access roads associated with timber production. The road management program restricts travel on many of the Forest roads to maintain effective elk habitat. However, the Forest feels that additional roading would greatly offset the benefits gained in forage and habitat production.

The Forest contains about 1.8 million acres, of which about 1/3 are classified as commercial forest lands available for timber harvest. This commercial forest land is found throughout the Forest (excluding existing wilderness). Some areas have less than 25 percent commercial forest, many areas have between 25 and 50 percent, and some areas have over 50 percent commercial forest land. The majority of the later areas are located along the Little Belt Divide and in the Castle Mountains. The Forest has historical harvest timber in these areas. During the 1950s and 1960s, the Forest harvested up to 36 million board feet (1964).

However, much of this volume was removed as pulp. The average volumes sold during the 1960s was 20 million board feet. However, timber sales dropped substantially in the 1970s averaging only about 8 million board feet. In the 1980s, so far the Forest has sold about 12 million board feet annually.

The Forest is on the lower side of site productivity for commercial forest land. Much of the Forest is classified one step above noncommercial forest level (site class IV). Therefore, we feel that much of the Forest would be best managed for semi-primitive settings.

The Forest feels there are opportunities to manage the timber resources, especially along the Little Belt Divide and the Castle Mountains. However, it is not cost-efficient to expand the timber program into many other areas of the Forest and where elk, semi-primitive recreation, and other values would be affected.

Concern-
Old Growth

A few commentators were concerned with old-growth management. Two reviewers felt that maintaining at least 5 percent of timber compartments as old-growth was inadequate. One commentator questioned why old-growth objectives had to be met in the commercial forest base. Another reviewer questioned the need for keeping 5 percent of the commercial forest land for old-growth, when so much acreage was allocated to nontimber management.

Commentators

RLT-20, RLT-126, RLT-271, RLT-299, RLT-311, and RLT-387.

Response

The Forest timber program will develop only 20 percent of the Lewis and Clark National Forest lands. The remaining 80 percent will be managed for other purposes and allow for the natural development of old-growth stands. The Forest feels that the retention of an additional 5 percent of the 20 percent of timber developed acres when coupled with the 80 percent of nontimber developed land will provide adequate dispersion of old-growth across the Forest. The Forest feels that the 5 percent standard coupled with other old-growth areas is adequate.

MINERALS

Concern- Oil and Gas Development

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 88 (17 percent) commented on minerals management.

Several commentators favored more oil and gas development because more oil and gas reserves were needed. Some reviewers felt that wildlife stipulations on the area where oil and gas potential were high could discourage exploration and development. This would cause a loss of revenues to local and state communities. One commentator felt that even with the restricted nature of the Proposed Plan the necessary access to explore for oil and gas was available.

Many reviewers were against oil and gas development because of the potential harm to wildlife, wilderness, scenic, roadless, and recreation values. Most all these comments dealt with the Rocky Mountain Division. Several commentators thought the little oil and gas that might be found was not worth the economic trade-off of wildlife and wildland values. Several reviewers supported full protection for T&E species and that T&E species should take precedent over any development.

Commentators

For Development: FLT-2-60, RLT-5, RLT-31, RLT-155, RLT-182, RLT-198, RLT-285, and RLT-286.

Against Development: FLT-3, RLT-26, RLT-38, RLT-49, RLT-65, RLT-93, RLT-120, RLT-140, RLT-142, RLT-150, RLT-151, RLT-218, RLT-225, RLT-235, RLT-272, RLT-281, RLT-302, RLT-305, RLT-350, RLT-373, RLT-391, RLT-395, and RLT-397.

Response

Based on previous environmental analyses, 423,373 acres of the Forest have been leased for oil and gas exploration and development. Special stipulations have been used to protect surface resources (see Chapter III). The Forest has had three applications for a permit to drill. One request was to re-enter an existing shut-in gas well in Blackleaf Canyon. The re-entry of the well has been completed and it was found capable of production. Drilling on the other two sites has not yet begun. These sites are Hall Creek, (near U.S. Highway 2), and Muddy Creek (near Blackleaf Canyon).

The Hall Creek Application has been approved by the BLM, but the decision has been appealed. Forest-Wide Standards G-1 and G-2 have been revised to insure oil and gas development is done in a manner which protects surface resources. (See Forest Plan.)

When the existing leases on the Forest expire, the issuance of new leases will be based on an analysis of current resource and other information, including oil and gas potential, T&E and other wildlife habitat needs, water quality, soils, and other resource values. New leases and subsequent leases will undergo additional analysis as required by NEPA, tiering to the Forest Plan and EIS. In addition, further analysis will be undertaken in compliance with NEPA when drilling on development projects are proposed.

Concern-Specific Areas

Some reviewers listed specific areas they did not want developed for oil and gas.

Commentators

Against Oil and Gas Development:

Badger-Two Medicine:
FPC-1, RLT-21, RLT-150, RLT-276, RLT-282, RLT-283, RLT-298, and RLT-305.

Dupuyer, Blackleaf, Muddy Creek:
RLT-21.

Choteau Mountain:
RLT-21.

Teton Canyon:
RLT-30.

Falls Creek:
RLT-58.

Big Snowies:
RLT-55.

Potential Wilderness:
RLT-30.

Supported Oil and Gas Development In:

Deep Creek-Reservoir North:
RLT-31, RLT-151, and RLT-302.

Response

The Forest has carefully reviewed oil and gas lease applications on these areas and recommended to the BLM appropriate stipulations to protect surface resources. The Badger-Two Medicine, Dupuyer, Blackleaf, Muddy Creek, Choteau Mountain, Teton Canyon, and Deep Creek-Reservoir North areas have been leased. In the Ford Creek Plateau area no-surface occupancy leasing during the first decade of the Plan will be recommended to protect wildlife values.

The Big Snowies, a Montana Wilderness Study Act area, is not available for leasing until Congress makes a decision on wilderness classification.

Concern-
Effect on
Environment

Several reviewers were concerned with the effects of oil and gas activities will have on the environment. Reviewers were concerned with roads built for oil and gas development and their effects on other resources, especially fish and wildlife habitat, T&E species, roadless resource, and water quality. One commentator recommended slow controlled or no development. The State of Montana was concerned that the decision to retain oil and gas roads for public and adminstrative use may conflict with other resources and should be made only after thorough interagency and public review. One reviewer felt that roading for mineral access should be permitted only if trail and/or helicopter access would impose an unreasonable hardship on the lease holder.

Two commentators felt it would be better to allow planned and controlled oil and gas exploration now, rather than have a crash approach under crisis conditions later. One commentator felt that oil and gas development should be allowed to occur only where roads already exist. Another reviewer supported more restrictive language for mineral access in Management Areas F, G, H, and Q.

Some commentators opposed oil and gas development until a full and specific EIS is prepared on each individual request. Some reviewers thought the DEIS-Supplement and Forest Plan failed to adequately address the impacts of oil and gas development. One commentator felt that Montana will bear the costs of oil and gas development and the profit will go out-of-state. One reviewer failed to see any benefits in developing the oil and gas resources because the commitment of resources will be irreversible. Some commentators wanted to see the

Forest Service play down oil and gas, and instead develop wind and solar power sites. One reviewer questioned whether past oil and gas sites had been rehabilitated. Two reviewers questioned how the Forest Service proposes to allow energy exploration/development in Deep Creek without significantly lowering wilderness qualities.

Commentators

OCB-7, PLT-3, RLT-39, RLT-56, RLT-84, RLT-149, RLT-150, RLT-151, RLT-191, RLT-240, RLT-284, RLT-287, RLT-302, RLT-310, and RLT-397.

Response

One of the major responsibilities on National Forest System lands is to manage, accommodate, and facilitate the exploration, development, and production of mineral resources. Exploration, development, and production of energy and other mineral resources including access are intergrated with the use and conservation of other resources to the fullest extent possible.

The Forest Plan details the standards on how oil and gas activities are to be conducted - to minimize the effects of the activity on other Forest resources. However, the Forest also recognizes that many reviewers feel that oil and gas development on the Rocky Mountain Division is not compatible with the wildlife resource, especially T&E species and their habitat. Wildlife and wildlife habitat are given the highest priority when seismic exploration, leasing, exploratory drilling, and oil and gas development decisions are made. Efforts are underway to develop a computerized cumulative effects analysis process to evaluate activities on grizzly bear and their habitat. (See Wildlife, Grizzly Bears, this chapter.) If critical areas are identified through this process, occupancy will not be permitted.

The Plan includes guidelines developed by an interagency group, including the Montana Department of Fish, Wildlife, and Parks, the Bureau of Land Management, the Forest Service, and the U.S. Fish and Wildlife Service, to minimize the effects of activities on wildlife and wildlife habitat.

The Forest Services works closely with and participates in review and approval of all drilling applications and on-the-ground projects in

conjunction with the BLM. The BLM has the authority for all lease activity and all of the off lease activities (such as access) are regulated by the Forest Service.

While the Forest Plan provides overall direction for oil and gas activities, drilling requests are handled on an individual basis, and receive site-specific environmental analyses at the time of the request. This analysis considers among many things access needs and road management. Under the drilling permit process, the Forest Service conducts an environmental analysis, and writes a biological evaluation considering the potential effects on T&E species. The U.S. Fish and Wildlife Service formally consults on the project and the biological evaluation to determine whether the project would adversely affect any T&E species. If the consultation results in a nonjeopardy situation for T&E species, the Forest Service then makes a recommendation to the BLM to approve the permit. Public and interagency involvement are a part of this process. In response to public concern, additional information has been added to the chapter on the environmental consequences on oil and gas development (Chapter IV). Past oil and gas sites have been rehabilitated.

Concern-
Oil and Gas
Demand

Some comments dealt with the demand and need for oil and gas. Commentators questioned why open up new areas to development when there is a surplus of oil and gas.

Commentators

OCB-9, RLT-120, RLT-151, RLT-240, and RLT-391.

Response

In spite of short-term surplus, there is still a high interest in hydrocarbon exploration in the northern disturbed belt. Exploration in complex areas will take a long time and energy companies are looking to the long-term need. The need for oil and gas was identified as an issue in the 1981 nonwilderness leasing analysis. The decision to lease considered the question of need and conveyed to the leaseholder the right to explore for and possibly develop and produce oil and gas resources on the lease. Exploration and production are subject to the conditions and stipulations attached to a particular lease.

Concern-
Wilderness

Some commentators opposed additional wilderness classification, especially in Silver King-Falls Creek and Renshaw areas, because of the forgone opportunity to explore for oil and gas. One

commentator said it would be unfair to mislead leaseholders who invest money in their leases only to designate the leased land as wilderness.

Commentators

RLT-182, RLT-198, and RLT-274.

Response

The Forest has reviewed the wilderness recommendations and in response to public comment, have made some changes in the areas recommended for wilderness classification (see Wilderness this chapter). Chapter IV, Environmental Consequences - Wilderness, shows the existing lease acreage in areas recommended for wilderness classification. Valid, existing mineral rights are recognized by the Wilderness Act.

Concern-Minerals

One commentator felt that not enough emphasis was placed on maintaining or encouraging new mineral development.

Commentators

RLT-285.

Response

The Forest has reviewed its mineral program. Because of the high wilderness, wildlife, and recreational values of the Forest, there are several restrictions that make mineral exploration and development more difficult. However, the Forest feels that the mineral program provides for a reasonable opportunity to explore for and develop the mineral resources while still protecting surface resource values.

SOIL AND WATER

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 16 (3 percent) commented on soil and water management.

Concern-

Several reviewers were concerned about sediment, water quality, and water quantity. Some commentators were concerned with the timing of increased water yields and the implication on downstream fisheries. Some reviewers felt that any increase in sediment would violate the National Forest Management Act. The State of Montana felt the concentration of needs in the Jefferson Division could have severe impacts on watersheds.

Commentators

Sediment Increase: RLT-118, RLT-154, RLT-232, RLT-239, RLT-241, RLT-303, RLT-308, RLT-312, and RLT-375.

Water Quality: PLT-2, PLT-3, RLT-54, RLT-232, RLT-241, RLT-306, RLT-312, and RLT-375.

Water Quantity: RLT-241, RLT-308, and RLT-395.

The State and other reviewers requested that more information on specific water yield and sediment yield by watersheds be presented.

Response

The Forest shares the concern of minimizing sedimentation and maintaining water quality. The effects of resource programs on soil and water have been reanalyzed.

Sediment as used in the EIS refers to solid material (eroded soils) being transported in flowing streams and is quantified as average tons per year. Sediment is a natural phenomenon in the Forest, noteably during the spring run off. Any significant ground disturbance (such as construction of trails and roads or concentrated animal use, particulary along stream banks) will increase that amount of sediment in the stream. A reasonable amount of sediment increase must be allowed if any use is to be made of an area. Even trails in the wilderness or heavy elk use on spring habitat contributes sediment to the water.

The State of Montana has defined "naturally-occurring" conditions as water quality existing after all reasonable soil and water practices have been applied. The key is to use any reasonable means to control sediment and to insure that the cumulative sediment yield increase does not unreasonably impact other values, particulary fish

habitat. Indications are that fish habitat may be adversely impacted when sediment yield increases exceed 20 to 30 percent (Platts).

In response to public concern, additional requirements have been added to Management Standards D-3, Riparian Area, Soil, and Water Protection In Range Management; F-3, Soil, Water and Air Protection; and L-3, Maintenance and Construction of Roads, Trails, and Other Facilities. Item (3) of Standard F-3, specifically requires a watershed analysis where significant vegetation removal is planned. (Also see Response-Erosion, Sediment, and Water Quality, Public Comment - DEIS, this chapter.) Roads will be kept to the minimum number and standard to meet Forest objectives.

Concern-
Riparian Areas

Some reviewers were concerned about activitiy in riparian zones and the need for more protection for these areas. Grazing and timber harvest were of greatest concern. One reviewer pointed out that better livestock distribution does not solve the riparian problems in many areas. One commentator wanted riparian management adequately addressed including defining excessive utilization levels for grass/forbs.

Commentators

PLT-3, RLT-93, RLT-293, RLT-311, RLT-312, and RLT-395.

Response

In response to public concern, additional requirements have been added to Management Standard D-3, Riparian Area, Soil, and Water Protection In Range Management to improve riparian area protection.

LANDS

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 13 (2 percent) dealt with lands, including land exchange and rights-of-way acquisition.

Concern-Land Exchange

Some commentators favored land exchanges to improve Forest management. Three commentators were concerned with specific land exchanges. Area identified by reviewers included private lands in Logging Creek, Moose Park, O'Brien Park, and Holter Gulch. One reviewer favored an aggressive land exchange program for areas intermingled with potential mining claims.

Plum Creek Timber Company, Inc. identified lands that it wanted to exchange.

Commentators

RLT-30, RLT-41, RLT-119, RLT-285, and RLT-375.

Response

The Forest has reviewed the Land Exchange Program in light of the above suggestion. However, no changes were made. The land exchange program identifies private lands which may be desirable for Federal ownership to enhance management, administration, or production of the Forest's resources. Acquisition of these lands will be considered in exchange proposals.

The Plum Creek Timber Company, Inc. lands, adjacent to the Forest, were examined for exchange purposes.

However, the majority of the recommended exchange tracts were outside the proclaimed National Forest boundary and cannot be considered for acquisition by the Forest Service under existing authorities. The one tract (Sec. 13, T.14N., R.3E.) within the Smith River Recreation Composite Plan has been identified as a desirable addition to the National Forest System.

Concern-Rights-of-Way

Several reviewers favored acquiring rights-of-way to improve access to National Forest lands. Some mentioned specific right-of-way needs, such as trail access into Deep Creek and road access into Dupuyer Creek, Blankenbaker Flats, Mead, Spotted and Coulee drainages, Crazy, Highwood, Snowies, and Little Snowies Mountains. Other commentators opposed right-of-ways across their land. However, some landowners said they would grant temporary access to remove timber.

Commentators

PLT-3, RLT-7, RLT-8, RLT-19, RLT-73, and RLT-232.

Response

The Forest has updated its rights-of-way program (Forest Plan, Appendix C).

Concern-
Utility Corridors

The BPA (Bonneville Power Administration) thought more consideration should be given to the management and protection of existing utility rights-of-way or potential corridors. They stated the Forest Plan did not mention corridor windows, exclusion, or avoidance areas. They also suggested the potential corridor segment which would affect the Lewis and Clark be identified.

Commentators

RLT-399.

Response

Utility corridor planning is discussed on page 1-11 of the Forest Plan. Each management area contains direction for utility-transportation management. This direction can be found in Chapter III under Land Use-Special Use Permits in the Forest Plan. This direction identifies exclusion, avoidance, and available areas. In response to BPA's concern, additional information on potential corridor segments and energy resource development has been added to the final Plan and FEIS.

Concern-
Land Uses

The U.S. Air Force expressed a concern for retaining the use of existing and establishing future military flight training areas and routes which may cross the Forest.

Commentators

RLT-4.

Response

The Forest shares this concern and will work with the U.S. Air Force on specific areas and routes to ensure wilderness and recreation values are protected.

FACILITIES

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 34 (6 percent) commented on facilities management, mostly concerning roads. The greatest concern was how new road construction would effect other resources.

Concern- New Road Construction

Several reviewers felt that new road construction was detrimental to certain resources, especially wildlife (mainly elk and threatened and endangered species), and water quality. They were especially concerned on the Rocky Mountain Division with roads developed for timber harvest and mineral activities. Some reviewers supported no new road construction. While others supported minimum road construction and road standards.

The State of Montana was especially concerned with additional roads in the Rocky Mountain Division, Little Belts, (South Fork of the Judith and Spring Creek/Whitetail Units), and the Castle Mountains. They wanted road construction plans be re-evaluated on a case-by-case basis. The State also questioned the use of capital investment money for road construction.

Some commentators felt that roads should not be constructed on land with greater than 40 percent slopes. Another commentator felt the Lewis and Clark Soil Resource Inventory and on-site inspection should be the basis for such decisions. Some reviewers pointed out that roads provide access for recreation, administration, fire protection, and firewood gathering. Other commentators supported road construction under the proposed Plan.

Commentators

OCB-5, RLT-54, RLT-69, RLT-89, RLT-93, RLT-187, RLT-225, RLT-234, RLT-239, RLT-241, RLT-271, RLT-276, RLT-277, RLT-278, RLT-283, RLT-289, RLT-301, RLT-302, RLT-311, RLT-312, RLT-375, RLT-387, RLT-391, RLT-395, and RLT-396.

Response

In response to public concern, road construction on the Rocky Mountain Division has been reanalyzed and only nonpermanent roads will be constructed for surface resource management. However, roads may be built for oil and gas exploration and development. The Forest recognizes that new road construction affects almost all Forest resources and uses. Management Standard L-4, Maintenance and Construction of Roads, Trails, and Other Facilities has been strengthened. The Forest has also reviewed road needs in the Little Belts and Castle Mountains, however, no changes have been made.

Concern- New Roads - Rocky Mountain Division	A few reviewers comments were about specific locations in the Rocky Mountain Division.
Commentators	Fairview: RLT-21. Elk Creek: RLT-21. Badger-Two Medicine: RLT-276 and RLT-288. Benchmark-Willow: RLT-21. Teton: RLT-21. Jones Creek: RLT-21.
Response	Roads for surface uses will not be constructed in the Fairview, Badger-Two Medicine, and Jones Creek areas. Nonpermanent roads may be constructed in the Elk Creek, Benchmark-Willow, and Teton areas. Any road proposal will have site-specific environmental analysis.
Concern- Road Management	Some commentators were concerned about when roads are closed and how the closures are enforced. Some reviewers wanted closures enforced, while others noted that closures were hard to enforce. A few commentators wanted road closure programs on the Forest to lower the conflict with wildlife. Some commentators questioned the Forest Service ability to control access and close roads. One reviewer wanted the impacts of roads evaluated when deciding to retain them for public or administrative use.
Commentators	RLT-23, RLT-126, RLT-144, RLT-194, RLT-199, RLT-294, and RLT-311. Some comments dealt with specific areas, rather than Forest-wide closures. Supported roads restrictions: PLT-3 and RLT-292. Supported no open mileage increases on the Rocky Mountain Front: RLT-191, RLT-229, RLT-281, and RLT-396. Supported no open roads in Management Area E: RLT-301.

Response

All of the Rocky Mountain Division (both wilderness and nonwilderness lands) have special restrictions governing ORV and other vehicle use. Wilderness is closed to all motorized use. Nonwilderness lands are either closed or restricted to the type of vehicle or season of use. In addition, 34 miles of road and 176 miles of trail are also closed or restricted.

About 20 percent of the Jefferson Division (222,400 acres) have special restrictions governing ORV and other vehicle use. In addition, 176 miles of road and 469 miles of trail are also closed or restricted to the type of vehicle or season of use, most new local roads will be closed or restricted.

In response to public concern, Management Standard L-2, Travel Planning, has been revised to strengthen the criteria for road management and emphasize compliance and enforcement. The Forest has just implemented a new Travel Plan which governs roads, trails, area closures, and restrictions. (Also see Public Comment-DEIS-Facilities, Road Management, Response.) Additional information on trail and road management has also been added to Chapter IV of this EIS.

Concern-
Number of Roads

Many reviewers were concerned with the number of roads or the amount of access. Some said there were too many roads, while others said there were too few. Some commentators were concerned about access throughout private land. Opposition dealt only with particular areas in the Crazy or Castle Mountains.

Commentators

Keep roads to a minimum: RLT-3 and RLT-387.

Response

In response to these concerns, additional standards have been added to L-4, Maintenance and Construction of Roads, Trails, and Other Facilities. These items require road construction and reconstruction to comply with the minimum density, costs, and standards necessary for a road's intended use, user safety, and resource protection.

PROTECTION

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 8 (2 percent) dealt with protection of Forest resources--fire management and reducing timber losses from insects and disease.

Concern- Insect and Disease

Some commentators recommended a higher level of timber harvest on available land, to prevent losses to insects, disease, and fire. One reviewer supported the Forest's approach to insect and disease problems, with even greater emphasis on harvesting and managing high risk stands. Two commentators opposed the mountain pine beetle management program. The reviewers felt that no control was needed and that fire should be used to break up the age classes of the Forest. One commentator felt that using insects and disease as an excuse to justify timber sales is deceitful. One reviewer questioned why road building was based on insect and disease control rather than economic feasibility or National need. Still another commentator felt the final Plan should include vigorous measures to control insects and disease problems. And, that timber sales include a reasonable balance between green and dead volumes.

Commentators

RLT-10, RLT-35, RLT-126, RLT-154, RLT-233, RLT-239, and RLT-387.

Response

The Forest feels that timber harvest is an appropriate way to deal with insect and disease problems on suitable timber lands. By scheduling 70 percent of the timber sale program in the lodgepole pine type, potential for epidemic loss can be reduced while still providing for a mix of sales. Dead volume is a part of the salvage component under the Forest Plan.

Concern- Fire Management

The State of Montana (Department of State Lands) asked to be consulted regarding specific fuel treatment practices for those areas under their protection, and suggested that coordination and contacts are made through the Central Land Office, Department of State Lands, Helena, Montana (P-9). And, fire management objectives be reworded to say "lowest cost plus net value change" in keeping with national criterion.

Commentators

RLT-395.

Response

The Forest agrees with this concern and will consult with all agencies regarding specific fuel treatment practices in those areas under their protection. As suggested by the State, changes in the final Plan have been made.

ECONOMICS

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 45 (9 percent) commented on economics.

Concern- Below Cost Sales

Many commentators indicated the Forest Service should not subsidize timber sales. They were opposed to below cost timber sales and stated that a timber sale should not be made unless financially efficient. Some commentators stated the economic return on timber is less than the loss in recreation, fisheries, and wildlife. Some reviewers felt that there was no benefit from sales.

Two commentators recommended that all timber sales support themselves. And, that low productivity areas be kept in reserve so that in a time when it was economically profitable to harvest the timber this could be done without increasing the National debt. Another reviewer felt the Forest Service should consider holding off sales until prices are high enough so that deficit sales are not a problem. One commentator felt that if a sale was not self-supporting, it should not be allowed without public debate. Some reviewers wanted the rationale for below cost sales. One reviewer was concerned that visual quality objectives and old-growth constraints have a potential to increase the number of below cost sales.

Commentators

OCB-5, PLT-1, RLT-27, RLT-34, RLT-36, RLT-38, RLT-55, RLT-87, RLT-157, RLT-160, RLT-185, RLT-199, RLT-236, RLT-239, RLT-241, RLT-289, RLT-294, RLT-298, RLT-303, RLT-308, RLT-311, RLT-312, RLT-359, RLT-385, and RLT-395.

Response

Our objective is to put together the best economic timber sale package possible. The economic situation of timber sales that may not return as many dollars in receipts as are spent to offer the sale is termed "below cost". The Forest has not determined "below cost" sales in the Forest Plan analysis. This can only be accomplished with a project by project analysis of individual sales scheduled in the Forest Plan 10-Year Timber Sale Program. However, in the development of the Forest Plan, National Forest System lands were examined and those lands suitable for timber production were identified. Suitability determinations are not based solely on economic criterion because of the multiple-use considerations that are used in the analysis. Constraints applied to the management of

these lands produce additional costs and benefits that are not measurable in dollar terms. Therefore, economic considerations are only one of many considerations used in suitability determinations.

Market conditions greatly influence the dollars received for National Forest timber. These conditions are determined by National level markets for housing construction and other business activities that the Forest Service has no control over. Local bidding competition for National Forest timber is also a factor that is not controllable by the Forest Service. Buyers of National Forest timber each bring their own costs, market expectations, and efficiency situation with them. Each of these items affects the amount of money timber buyers will pay for stumpage.

Forest Service costs are a controllable item to a certain degree. However, many of the costs involved in selling timber result from legal requirements or policies enacted to protect, manage, and perpetuate Forest resources. Some costs can be reduced through increased efficiency, but many are required and will have to be paid if timber harvesting is going to take place. Road construction and reforestation are long-term costs that may make the cash flow situation look poor in the short-term. Benefits are derived over time, but the costs occur today.

The cash flow situation can vary significantly as Forest Service costs are reduced through efficiency improvements and market conditions that affect price changes. The consideration of timber sale economics is one of the important considerations in Forest management and will play a major role in the implementation phase of forest planning. When the analysis is made of a specific timber sale it is expected that some sales will be "below cost". This economic analysis will be used along with environmental and other resource management needs in the final determination of whether or not to proceed, modify the sale, or delay any timber harvesting in the area (see Management Standard E-4, Timber Harvest, Forest Plan). We expect significant results in assuring timber sales are prepared in the most cost-efficient manner, through improving the cash flow posture of the timber sale and road program. Visual quality objectives and old-growth constraints have little affect on "below cost" sales.

A linear programming model, FORPLAN, was used to examine each of the alternatives. In calculating which of the lands tentatively suitable for timber harvest would provide the greatest contribution to present net value. FORPLAN examined values and costs over a 150-year planning horizon. The advantages and disadvantages of delaying harvests to later decades, with higher projected prices for timber, were calculated by FORPLAN. Some areas were scheduled for harvest in later decades due to improved timber economic conditions in the future.

Concern-
Timber Harvesting
Specific Areas

The economics of timber harvesting on the Rocky Mountain Division received some comments. Commentators stated that timber on the Rocky Mountain Division was marginal and has always been economically unsound. The State of Montana expressed serious concern about the economics of timber harvest and the effect of roading on the Rocky Mountain Division.

Commentators

RLT-118, RLT-225, and RLT-395.

Some commentators identified specific areas on the Rocky Mountain Division where they felt timber values were not economical.

Badger-Two Medicine: RLT-140 and RLT-151.

Olney Creek: PLT-1 and RLT-27.

The State of Montana also questioned the timber sale program on the Jefferson Division when below cost sales adversely affect other important resource values.

RLT-395.

Other commentators were concerned with specific areas or timber sales they felt were below cost in the Jefferson Division.

East Little Belts: RLT-275.

Running Wolf: RLT-241.

Deadhorse: RLT-241 and RLT-275.

Mill Lion: RLT-241 and RLT-275.

Mizpah: RLT-241 and RLT-275.

Yogo: RLT-275.

Lower Sage: RLT-275.

Bear Park/Sawmill/Yogo Divide: RLT-241.

East Fork Spring Creek: RLT-275.

Response

Economically, it is less desirable to harvest timber on the Rocky Mountain Division than the Jefferson Division, due to higher road construction costs and greater haul distances. However, on the Rocky Mountain Division there is a local need for wood products, including posts, poles, firewood, houselogs, and sawlogs. Section 6(k) of the NFMA requires the Forest Service to identify lands not suitable for timber production. Economics is one of the factors. PNV of harvesting timber in the Rocky Mountain Division is a positive value.

The harvest on the Rocky Mountain Division has been reanalyzed and reduced to small sales of posts, poles, firewood, houselogs, and sawlogs for local needs with no permanent roads. About .5 million board feet will be harvested annually. The Forest feels this program will meet local needs and protect other values.

PNV of harvesting timber in the Jefferson Division is also a positive value.

In response to public concern, standards have been added to ensure that timber sale economics are given adequate consideration in project implementation (see Management Standard E-4, Timber Harvest, Forest Plan). Additional information has also been added to the final Plan.

Concern-
More Timber

Some commentators did not agree that the timber harvest level should be increased. And, they did not see the timber program becoming any more economically self-supporting.

Commentators

PLT-1, PLT-3, RLT-27, RLT-32, RLT-36, RLT-70, RLT-92, RLT-193, RLT-232, RLT-235, RLT-271, and RLT-294.

Response

Timber harvest is an important factor contributing to the present net value of resources on the Forest. This is shown by the amount of timber harvest in PNV Benchmark, 69.5 million board feet. The Forest is working on several ways to reduce

timber sale costs, including reducing road costs, roading from the front end, concentrating harvest areas, using natural regeneration, and making better use of Forest Service employees by sharing positions with adjacent Forests.

The forest products industry is an important component of Montana's economy. The industry accounts for 8,000 to 10,000 jobs, $240 million dollars in wages, and $740 million dollars in goods produced. It is especially important in western Montana where it accounts for almost half of that region's economic base.

While the economic aspects of the timber industry are less predominate in eastern Montana, the industry is still an important contributor to jobs, income, tax base, and community stability.

A Forest Service objective is to assure sound management, both for timber sales and for transportation planning and construction. Objectives will be met in the most economic fashion possible and still maintain environmental quality. The Forest will continue to make some sales that do not return their cost, but we will assure that such sales are in the public interest.

The proposed harvest level was reanalyzed and arrived at after a full consideration of the issues, concerns, and opportunities on the Forest. The economics and trade-offs associated with the proposed timber program were discussed in the supplement to the DEIS. They have been expanded on in the final EIS.

Concern-
Timber Values

Some commentators were concerned with the economic value of timber. One commentator stated that the revised Plan relies on cut lumber values, rather than stumpage values, which greatly exaggerates the value of the standing timber. One reviewer felt that economics should be de-emphasized and sales should be designed to benefit wildlife and to provide visual and vegetative diversity.

One reviewer felt that if the Forest was going to operate on a positive cash flow for timber, that wildlife, wilderness, recreation, range, and water should also be managed in such a way as to provide a positive return to the U.S. Treasury. One commentator felt the economic benefits that local communities enjoy as a result of hunting, fishing,

and wildlife viewing should be included because the economic benefits of timber harvest to communities has been recognized.

Two reviewers including the State of Montana felt the income and employment impact for the Preferred Alternative G were significantly below the average of the 16 alternatives and that it is unclear why they are so low.

Commentators

RLT-159, RLT-312, and RLT-375.

Response

Timber values are based on value of sawlogs delivered at the mill, not lumber prices. Timber values were assumed to increase in real terms during the first 5 decades. For the remaining periods, these values remained constant (see FEIS, Appendix B).

Where appropriate, timber sales are designed to benefit wildlife and to provide visual and vegetative diversity. Separate management areas are established which give special emphasis to the visual or wildlife resource when designing timber sales. Visual and wildlife values are considerd in the development and design of all timber sales regardless of the management area designation.

The Forest is not restricted to operate on a positive cash flow for any program, but to operate in the most efficient fashion possible. The economic analysis did include dollar values for range, recreation, and oil and gas leasing as well as timber in evaluating economic benefits (see FEIS, Appendix B).

The income and employment projection for the Preferred Alternative (G) were checked and found to be correct. The reason they are lower is that less income and employment are available under this alternative, because of the resources produced. First decade outputs are quite similar to first decade outputs under the current management direction so there would be little change in income and employment.

Concern-
Recreation Benefits

Some commentators felt that the Forest should be more recreation oriented. This in turn would help the Montana economy, which is highly dependent on recreation. Some reviewers emphasized the importance of snowmobiling to the local economy. While others supported roadless recreation and tourism.

Two commentators thought that maintaining wildlife and hunting opportunities especially in the Rocky Mountain Division and Middle Fork Judith would increase income to outfitting businesses. Both the State of Montana and WETA supported more developed recreation to benefit the local communities. One commentator was still critical of the value of hunting RVDs at $21.00 per RVD. They also wanted the income from hunting on the Lewis and Clark National Forest to be included in the analysis.

Commentators

RLT-126, RLT-151, RLT-157, RLT-176, RLT-193, RLT-272, RLT-282, RLT-285, and RLT-312.

Response

The Forest recognizes the importance of recreation to the overall present net value of the Forest. Recreation values were reviewed in response to public comments. Recreation values are included in the economic analysis, based on "willingness to pay" values, not including indirect benefits. The same is true for other resources, including timber. Snowmobile recreation values were included in the economic analysis. The value for the hunting RVD also represents a "willingness to pay" value. A "willingness to pay" value is a surrogate market value. The value of a hunter RVD when compounded to 1984 dollars (the value of $21 per RVD is in 1978 dollars and must be multiplied by 1.47 to compound it into 1984 dollars) is approximately $31.00. If indirect costs were added including the additional costs for fuel expenditures, licenses, and ammunition. The 1984 dollar value of a hunting RVD is about $50.00 per RVD.

Concern-Range Management

One reviewer was concerned about the economics of range management and the low grazing fees. Another commentator stated the Forest Service still may be relying on a value of $11 per AUM to evaluate grazing benefits while receiving only $1.83 AUM. These figures distort the actual benefit.

Commentators

RLT-293 and RLT-312.

Response

Range values were reviewed in response to public comment. The value for range was developed by the USDA-Economics Research Service. The value of any unit of forage is measured by the maximum amount of dollars which the consumer would be willing to pay for that unit. For the Lewis and Clark Forest, that value is $11.69 per AUM. It appears to be commensurate with what is being charged for grazing on private land.

The economic analysis done on all the alternatives used $11.69 per AUM as the economic value of that resource. It is true that the actual grazing fee received by the Forest is less than the economic value assigned per AUM in our analysis. The grazing fee however, does not necessarily represent the full market value of the resource. The U.S. Congress passed the Public Rangelands Improvement Act of 1978 (PRIA) which established, on a 7-year trial basis, the formula that the Forest Service and Bureau of Land Management used to calculate grazing fees. The formula considers the rates for leasing private grazing lands, the difference between costs of grazing on public and private lands, beef cattle prices, and the costs of livestock production. This fee formula, established by the U.S. Congress, does not require or assure that the fee arrived at be equal to the market value of an AUM of forage.

Using the market value per AUM is similar to using the willingness to pay value (surrogate market value) for recreation benefits. In both cases, the Forest models the full value even though it may only capture a portion of that value in returns. As an example, a family of four staying at a campground on the Forest might pay $4.00 for an overnight stay while our analysis would model the full benefit value of $3.00 per recreation visitor day (12 hours) times 4 recreation visitor days (four family members camping for 12 hours) which equals a benefit of 12 dollars even though the Forest only collects 4 dollars.

Concern-
Timber Benefits

Two commentators felt that the timber industry was not a reliable source of income, and they would prefer placing more emphasis on the recreation aspects of the Forest.

Commentators

RLT-54 and RLT-69.

Response

Forest products is one of the State's most cyclic industries. Montana's forest product industry rebounded from the latest recession in 1983. Long-term outlooks are for slightly less employment and earnings than in the late 1970s. However, the forest products industry is still a major component of Montana's economy. As a source of income, recreation jobs have been more seasonally affected and have traditionally paid less and have generated less derivative income than jobs in the forest products industry.

Concern-Roads	Some commentators felt that the Forest Service can not justify continued roads to support deficit timber sales. One reviewer stated road standards and road mileage should be kept to the minimum to increase economic efficiency.
Commentators	RLT-93, RLT-156, RLT-237, RLT-240, RLT-284, RLT-293, and RLT-375.
Response	Local roads are usually constructed on the Forest to access and utilize the timber resource. Construction costs are usually part of timber sale contract requirements. Arterial and collector roads are part of the general Forest Road System. Actually few new arterial or collector roads have been built in the last few years even though the projects may have been labeled "construction" for programming purposes. Rather, substandard facilities have been upgraded to handle logging traffic and improve serviceability for all users. Much of the Forest's existing arterial and collector system was not "constructed" per se, but simply developed through use. As such, these roads are largely unmaintainable, limited to four-wheel drive for much of the year, and in some places are hazardous. Wheel track erosion cannot be controlled. It is in this area of improving the existing arterial/collector system where the Forest has spent the bulk of its construction/reconstruction budget over the past several years. A substantial portion of the Forest's road construction/reconstruction budget has little or nothing to do with the timber resource. (Crystal Lake, Dupuyer Creek, Dearborn River Trailhead, Kings Hill Snowmobile Parking, Belt Park Connector, Divide Road, Ford Creek Bridge, Hannon Gulch Bridge, Checkerboard Road, Sun River Road, and North Fork Teton Road, etc.) Upwards of 96 percent of the benefactors of the improved arterial/collector road system are recreationists including firewood cutters, hunters, and general Forest visitors. The economic analysis for proposed timber sales takes into account road cost. An additional standard has been added to the Forest Plan to minimize road density, cost, and standards (Management Standard L-4, Forest Plan).

SOCIAL

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 28 (5 percent) commented on social impacts.

Concern-Employment and Income

Several comments stated the importance of Forest timber to the regional economy and local employment, income, and tax base. They felt that additional timber must be provided to meet the best interest of many communities dependent on the timber industry for jobs and support of the local economy. One commentator felt that more emphasis should be placed on maintaining or encouraging new development that would insure healthy employment.

Commentators

FLT-2, FPC-2, RLT-18, RLT-35, RLT-60, RLT-89, RLT-121, RLT-123, RLT-126, RLT-159, RLT-171, RLT-200, RLT-201, RLT-202, RLT-285, and RLT-389.

Response

The Forest Service realizes its economic importance to local communities. The Forest Plan will gradually increase timber harvesting over the next 50 years. In the next decade, harvest will remain at the current level. In 10 years the Forest Plan will be assessed again. During that time the supply/demand relationship of timber will again be examined. The Forest could harvest more timber, but does not to protect and maintain other resource values.

Concern-Blackfeet Treaty Rights

Several commentators felt the Forest Plan did not adequately address the Blackfeet Treaty Rights. They urged more cooperation with the Blackfeet. The Blackfeet Tribe suggested several changes and additions to Management Standards H-1 and H-2. One reviewer wanted more information on the Blackfeet Treaty rights. Some reviewers wanted all activities on the ceded lands suspended until the legal and resource rights are resolved. Some reviewers also questioned the right of the Forest Service to restrict access on ceded lands. Some commentators urged cooperation with the Blackfeet in managing the timber resource. Other commentators expressed concern with the management of other resource on the ceded lands. The USDI wanted the Blackfeet Tribe to be considered for increases in grazing privileges on the Rocky Mountain Division.

Commentators

PLT-4, RLT-19, RLT-20, RLT-37, RLT-77, RLT-144, RLT-229, RLT-234, RLT-240, RLT-281, RLT-288, and RLT-305.

Response	The Blackfeet Indian Treaty rights are discussed in Management Standard H-1, Native American Claims, and their traditional religious rights in Management Standard H-2, Native American Rights, and throughout the FEIS (Chapters III and IV). While there are several issues that may take legal review, we are meeting with representatives of the Blackfeet Tribe to isolate and discuss issues over which we can agree. The Blackfeet Tribe's suggested changes and additions were incorporated into Management Standards H-1 and H-2.

ALTERNATIVES	Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 12 (2 percent) commented on one or more of the alternatives.
Concern-Current Direction	One reviewer favored the Current Direction. They did not want any changes in the management of the Forest.
Commentators	RLT-286.
Response	The Forest feels that many opportunities for improved resource management would be forgone if the Current Direction was continued. These include maintaining additional roadless area, increasing timber, grazing, wildlife habitat improvement, and trail construction.
Concern-Alternative A	One reviewer favored Alternative A-1 because it met the RPA Program for timber harvest. Two commentators favored A-2 because of increased grazing, and timber harvest levels.
Commentators	RLT-159, RLT-172, and RLT-333.
Response	Alternative A-1 and A-2 would have a significant adverse effect on elk and trout population potentials, elk hunting opportunity, and semi-primitive recreation settings.
Concern-Alternative C	One reviewer favored Alternative C. The reviewer was concerned with decreases in wildlife population and semi-primitive recreation opportunities under other alternatives. They felt Alternative C had the least change in the physical and biological environment.
Commentators	RLT-232.
Response	While Alternative C would have little change in the physical and biological environment, the Forest feels the alternative forgoes many opportunities to increase resource production. The Preferred Alternative G maintains elk and trout population potentials and 85 percent of the roadless lands.
Concern-Alternative H	Five commentators commented on Alternative H. The commentators supported Alternative H, because it maximizes wilderness classification.
Commentators	RLT-30, RLT-158, RLT-287, RLT-309, and RLT-387.

Response

The Forest has carefully reviewed it's wilderness recommendations, and although some changes have been made, Alternative H is not the Preferred Alternative. The Forest feels that Alternative H does not provide the greatest net public benefit, because many semi-primitive recreation and other opportunities will be forgone with wilderness classification on 664,326 acres.

Concern-Alternative J

Two commentators including members of the Montana Snowmobile Association favored Alternative J. It was favored because of the reduced acreage recommended for wilderness in the Silver King-Falls Creek area. Many snowmobilers use this area and did not want to see this opportunity lost because of wilderness classification. It was also favored by one oil and gas company because it has less restrictions on potential future hydrocarbon discoveries.

Commentators

FLT-1 and RLT-274.

Response

The Forest recognizes the conflict of wilderness classification with snowmobiling and potential hydrocarbon discoveries. However, because of the high wilderness value, no significant changes have been made in the Forest Service recommendation for wilderness in the Silver King-Falls Creek area.

Concern-Alternative K

Two commentators favored Alternative K. One reviewer felt that the alternative was a suitable compromise on wilderness classification, and that wilderness values would receive more protection.

Commentators

PLT-3 and RLT-312.

Response

The Forest feels Alternative K forgoes many opportunities to increase resource production and does not provide the greatest net public benefit.

MANAGEMENT AREAS

Concern-
Rocky Mountain Division

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 38 (7 percent) voiced a concern with specific management areas.

One reviewer supported semi-primitive recreation for the Rocky Mountain Division. The State of Montana supported increased wildlife designation on the Rocky Mountain Division. The State and USDI felt that the area adjacent to BLM Outstanding Natural Areas should be managed as proposed by the BLM. One commentator did not favor any additional road building. While two commentators expressed general concern with the proposed management.

Commentators

RLT-21, RLT-301, RLT-304, and RLT-395.

Sun Canyon: Two reviewers favored leaving the area as it is now.

RLT-21 and RLT-375.

Benchmark-Willow: Ford Creek Plateau should be Management Area I.

RLT-151.

Deep Creek: Several reviewers felt that oil and gas exploration would compromise wilderness values.

RLT-151, RLT-301, RLT-311, RLT-375, and RLT-395.

Elk Creek: Eliminate the O designation on Bailey Creek.

RLT-375.

Badger-Two Medicine: The proposed land would adversely affect water quality, fisheries, riparian habitat and the National Recreation Trail. Management Area is not acceptable.

RLT-21 and RLT-194.

The commentators felt that oil and gas exploration and timber harvest would conflict with high wildlife values, especially grizzly bear habitat.

RLT-131, RLT-271, RLT-301, RLT-375, and RLT-395.

Blackleaf-Dupuyer: Should be designated for wildlife. Do not allow ORVs.

RLT-375.

Falls Creek: Two reviewers thought the East Fork of Falls Creek should be included in the wilderness recommendation or should be Management Area I.

RLT-301 and RLT-375.

Sawtooth: RLT-21 and RLT-375.

Olney Creek: Olney Creek is not suitable for timber management.

RLT-21.

Middle Fork Teton: The "H" designation should not extend beyond the road end at Cave Mountain.

RLT-375.

Jones Creek: Eliminate the road up Jones Creek.

RLT-21.

Renshaw: One reviewer favored Management Area Q, while another thought wilderness recommendations should be extended to Red Hill. At the very least it should be Management Area I.

RLT-21 and RLT-375.

Patricks Basin: One commentator did not favor changing the wilderness boundary near Patricks Basin and Our Lake.

RLT-119.

Teton: Do not allow any additional road construction. Supported semi-primitive recreation management, the head of the West Fork is not suitable for timber management.

PLT-1, RLT-21, RLT-27, and RLT-375.

Sun Canyon: Suppported the proposed management.

RLT-375.

Response

All Management Areas have been reviewed by resource specialists and land managers to insure the proposed management area direction fits the land's capability and reflects the intent of the Forest Plan. Specific changes in the management areas are shown on page 1-3 in the final Plan.

On the Rocky Mountain Division, timber harvest is still proposed in the Teton, Benchmark/Willow, and Elk Creek/Falls Creek Geographic Units. However, in response to public concern, sales will be limited to posts, poles, firewood, houselogs, and other miscellaneous products. (See Public Comment-DEIS-Supplement, Timber.) There has been some adjustments of management area boundaries to reduce resource conflicts. The Upper West Fork (Olney Creek) of the Teton has been recommended for wilderness classification. Bailey Creek has been removed from the O designation. Regulated timber harvest in the Badger-Two Medicine Geographic Unit is limited to the Blackfeet Tribe under their Treaty Rights. Additional wildlife areas have been designated on the Rocky Mountain Division. Ford Creek Plateau has been designated Management Area I. The "H" designation has been cutoff at Cave Mountain. Like the BLM Outstanding Natural Area, all of the adjacent lands are leased. However, surface management of the area is compatible with the BLM designation.

Concern-
Glacier National Park -Wilderness

One commentator supported a buffer zone to protect Glacier National Park and adjacent wildernesses.

Commentators

RLT-276.

Response

The Forest recognizes the special need to adjust management activities adjacent to Glacier National Park and wildernesses. However, we feel a buffer zone is not the proper way to manage adjacent lands.

Concern-
Jefferson Division

Paine Gulch

One commentator questioned the use of ORV in Management Area M.

Commentators

RLT-375.

Response

There are no restrictions on ORV use. The Forest feels that ORV use is not a problem in this management area. If a problem does develop, the area can be closed to ORV through the Forest Travel Plan.

Concern-Tenderfoot-Deep Creek

Two reviewers supported the proposed management (Management Area F) for the Tenderfoot-Deep Creek area. Two commentators questioned any timber harvest near Tenderfoot Creek. One commentator supported moving Management Area B north at least one mile at the mouth of Iron Mine Creek and that the Tenderfoot corridor should be semi-primitive management to protect the cutthroat trout fisheries.

Commentators RLT-3, RLT-23, RLT-27, and RLT-375.

Response The Forest has reviewed the suggestions, but no changes have been made. We feel regulated timber harvest in the B Management Area is an appropriate land use and that the cutthroat fisheries can be protected.

Concern-Northwest Little Belts

One commentator supported the proposed management but questioned why the private land along Logging Creek was not suitable for acquisition when private land on Belt Creek was suitable.

Commentators RLT-375.

Response Lands along Logging Creek were identified as suitable for acquisition.

Concern-Highwoods

One commentator questioned the designation of Management Area B and D in the Highwoods. One commentator favored the management as proposed.

Commentators RLT-29 and RLT-375.

Response The Forest has reviewed the management area designation in the Highwoods. No changes have been made as both management area designations are believed to be appropriate by the Forest Interdisciplinary Team.

Concern-Middle Fork Judith

The State of Montana felt the importance of elk hunting outweighed the proposed timber harvest in the area. And, that road and timber harvest would adversely affect the elk population and hunter recreation by reducing hiding cover for elk. One commentator favored Management Area C for the Harrison Creek drainage to protect elk values.

Commentators PLT-1, RLT-27, RLT-375, and RLT-395.

Response The opportunity to harvest timber while protecting the high elk values in the Middle Fork was carefully reviewed. In response to the State and others concerns, the area proposed for timber management

(11,600 acres) has been changed from Management Area B to C. This will place additional emphasis on elk security cover.

Concern-
South Fork Judith

One commentator favored more Management Area C designation. They also supported a visual corridor from the South Fork Judith to the Whitetail Cabin.

Commentators RLT-357.

Response The Interdisciplinary Team reviewed the possibility of increasing Management Area C designation, but found that the important elk cover area had been identified. The lower South Fork of the Judith Road has been designated as a sensitive visual road, but the remainder of the road has not been designated because of changes in the type of user.

Concern-
Oti Park

Supported the proposed management.

Commentators PLT-1.

Response No response necessary.

Concern-
Big Baldy

Supported proposed unroaded management.

Commentators PLT-1.

Response No response necessary.

Concern-
Hughsville-Neihart

One commentator favored more Management Area B in the Hughesville-Neihart area for timber harvest and mineral development.

Commentators RLT-223.

Response The Forest has reviewed the suggestion for more Management Area B, but no changes have been made. The Forest feels regulated timber harvest is not appropriate for this area. The area is open to mineral entry.

Concern-
Sawmill Creek, T.W. Mountain, Big Baldy

Three reviewers supported changing the F and G designation to a B designation to increase commodity production.

Commentators RLT-223, RLT-290, and RLT-291.

Response

The Forest has also reviewed this suggestion, but no changes have been made. The Forest feels regulated timber harvest is not appropriate for this area. The area is open to mineral entry.

Concern-
Wolf Creek

One reviewer felt that the B designation was too extensive. They supported Management Area G designation at the heads of Placer, Snow, and Butcherknife, and Management Area I designation around Bear Park.

Commentators

RLT-375.

Response

The suggested management designations were reviewed but no changes have been made. Management Area B with regulated timber harvest is appropriate.

Concern-
Castle Mountains

One reviewer supported more Management Area C instead of B.

Commentators

RLT-375.

Response

We agree, some additional area in the Castle Mountains has been designated Management Area C.

Concern-
Forest Lake

Two commentators were concerned with management of Forest Lake. The State of Montana was concerned with the impact on the cutthroat trout fishery of Forest Lake in the Crazy Mountains due to the timber and range designation for land that surrounds the lake.

Commentators

RLT-375 and RLT-395.

Response

The Forest has reviewed the management area designation around Forest Lake. No changes have been made. Riparian values will be protected through established standards and management direction.

Concern-
Spring Creek

The State of Montana was also concerned with extensive timber harvest in the Spring Creek Geographic Unit and the possible effects on water quality on the North Fork of the Musselshell.

Commentators

RLT-395.

Response

The Forest has reviewed the proposed timber harvest in the Spring Creek Geographic Unit, and has analyzed the effects on sedimentation on the North Fork of the Musselshell. Although sediment is projected to increase by about 6 percent, the Forest feels water quality standards will be met.

Concern-Deep Creek /Pilgrim Creek	Two commentators supported the management for the Deep Creek/Pilgrim Creek area.
Commentators	PLT-1 and RLT-27.
Response	No response necessary.
Concern-Hoover Springs, Head of Smith, Oti Park and Middle Fork Judith	One commentator agrees with removal of lands for timber management in Hoover Springs, Head of Smith, Oti Park, and Middle Fork Judith. They also agreed with timber base reduction in the Jefferson Division.
Commentators	PLT-1.
Response	No response necessary.
Concern-Roadless Management	A few reviewers supported the proposed roadless area management. Two reviewers specifically supported the roadless designation in the Jefferson Division. Two reviewers wanted all roadless area to remain wilderness.
Commentators	RLT-23, RLT-27, RLT-120, RLT-154, RLT-236, RLT-271, and RLT-387.
Response	No changes in the roadless designation have been made in the Jefferson Division; no wilderness classification has been recommended. Alternative H examined designation of most roadless lands as wilderness. This alternative was not selected as the preferred alternative because it did not maximize net public benefits.
Concern-Management Area B	One commentator felt that more attention should be given to the possible impacts of timber harvest on other resources in Management Area B.
Commentators	RLT-232.
Response	Impacts of timber harvest on other resources in Management Area B were considered. The Forest feels the proposed management direction coupled with the Forest-Wide Standards will mitigate the impacts of timber harvest on other resources.
Concern-Management Areas E and I	One commentator supported additional land in Management Areas E and I. One commentator wanted the E areas near Badger Cabin changed to Management Area I. Both reviewers favored additional Management Area I near the Judith Game Range.
Commentators	RLT-151 and RLT-232.

Response

In response to public concern, additional Management Area I has been designated both on the Rocky Mountain and Jefferson Divisions (near the Judith Game Range). No changes have been made in the E designation near Badger Cabin.

Concern-Management Area F

One commentator wanted more restrictive wording on timber cutting. One reviewer questioned why if Management Area F was to be designated for semi-primitive recreation, why allow utility transportation corridors and facility siting and roads.

Commentators

RLT-84 and RLT-194.

Response

No regulated timber harvest or road construction for surface resources is permitted in Management Area F. Salvage, posts, poles, firewood, and other products may be removed but such use will be insignificant. Roads are permitted for mineral exploration and development if it is the next logical step. Management Area F is an avoidance area for utility corridors and facility sitings.

Concern-Management Area G

Three commentators supported no suitable timber management in Management Area G. The State stated that the modification VOO is inconsistent and inappropriate for Management Area G.

Commentators

RLT-121, RLT-241, RLT-275, and RLT-395.

Response

No regulated timber harvest is permitted in Management Area G. Posts, poles, firewood, and salvaged harvest is permitted, and short segments of road can be constructed. The VQO in Management Area G is usually retention and partial retention. Modification may not be appropriate, but it will take site-specific analysis to determine this.

Concern-Management Area N

The State also felt that preservation should be mandated until the wilderness decision is made.

Response

Preservation is not appropriate because the area is leased for oil and gas exploration.

Concern-Agreement with Forest Plan

Several commentators expressed general agreement with the Forest Plan.

Commentators

RLT-15, RLT-88, RLT-119, RLT-182, RLT-196, RLT-233, and RLT-238.

Response

We appreciate the support for the Forest Plan. No further response necessary.

Concern-Disagreement with Forest Plan	Several reviewers expressed general disagreement with the Forest Plan while one commentator felt it could be better.
Commentators	RLT-294, RLT-296, RLT-350, and RLT-387.
Response	As a direct result of public comments, many changes have been made in the final Plan.

ADMINISTRATION

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 4 (1 percent) had concerns with Forest administration.

Concern-Wildlife

One commentator felt cooperation with the Montana Department of Fish, Wildlife, and Parks should be improved.

Commentators RLT-311.

Response The Forest is working on strengthening working relations with the Department of Fish, Wildlife, and Parks.

Concern-Range Management

One reviewer stated that livestock trespass is a serious problem on some areas of the Forest. And, that the Plan does not deal with the problem. Another commentator stated that although current management direction provides for no range deterioration caused by domestic livestock, the fact is range deterioration is occurring. An example is the Highwood Mountains.

Commentators RLT-241 and RLT-311.

Response The Forest knows of no serious livestock trespass problems. Livestock trespass is dealt with under established regulations and policies. The Forest has just completed two major allotment plans in the Highwood Mountains. These plans call for an adjustment in the season of use, additional structural improvements, and prescribed burning to increase forage production. The allotment plan did not identify any poor or very poor range conditions.

Concern-Timber

One reviewer felt that small timber operators do not receive the same level of scrutiny as large operators.

Commentators RLT-311.

Response The Forest agrees that small timber operators do not receive the same level of scrutiny as large operators. However, the Forest feels they do receive adequate administration based on the nature of their operations and the resource values involved.

Concern-General	Two commentators supported the establishment of a ranger station on the north end of the Rocky Mountain Division.
Commentators	FLT-2-60 and RLT-286.
Response	The Forest is working on providing additional administrative facilities and personnel on the north end. The facilities would be administered through the Rocky Mountain Ranger District office in Choteau, Montana.

MUTIPLE USE

Concern-Summary of Major Comment

Of the 531 comments on the DEIS-Supplement and Revised Proposed Plan, 9 (2 percent) commented on multiple-use management.

Several commentators supported multiple-use of the Forest, especially on the Rocky Mountain Division, and felt the Revised Proposed Plan would decrease the opportunities for grazing, lumbering, mineral exploration, and recreation. They supported more areas for "multiple-use" management. Other reviewers felt multiple-use was being abandoned in favor of commodity production, especially on the Rocky Mountain Division.

Commentators

FLT-2, RLT-87, RLT-126, RLT-223, RLT-289, RLT-307, RLT-312, RLT-375, and RLT-388.

Response

The Forest also supports multiple-use management. The Preferred Alternative (G) provides for an increase in grazing, the timber sale program, and recreation. Dispersed recreation opportunities are emphasized. The Preferred Alternative also provides opportunities to explore for and develop mineral resources. Wildlife habitat and water quality are maintained. Multiple-use has not been abandoned in favor of commodity production, especially on the Rocky Mountain Division. Under the final Forest Plan, the Rocky Mountain Division will be managed as follows:

	Final Plan
Wilderness	384,407 (50%)
Recommended Wilderness	51,834 (7%)
Wilderness Study	41,838 (5%)
Timber/Range	22,702 (3%)
Range/Wildlife	68,014 (9%)
Semi-Primitive Recreation	56,504 (7%)
Custodial Management	113,665 (15%)
Developed Recreation	4,664 (1%)
Wildlife	14,866 (2%)
Riparian	7,674 (1%)

PROCESS

Of the 531 comments on the DEIS-Supplement and Revised Proposed Forest Plan, 64 (12 percent) reviewers commented on the Forest Planning Process.

Concern-Recreation

One commentator felt a variable RVD (Recreation Visitor Day) should be used, rather than a fixed RVD, to make a meaningful comparison. One reviewer suggested a clearer display of motorized opportunities.

Commentators

RLT-285 and RLT-312.

Response

A constant RVD (a 12 hour period) is used so that meaning comparisons can be made. A variable RVD would not allow this comparison. The Travel Plan shows in detail motorized recreation opportunity. The Travel Plan is prepared using standards listed in the Forest Plan.

Concern-Wilderness

Some commentators felt that the reasons for not recommending more wilderness or reducing the acreage recommended for wilderness were not clearly explained. One commentator questioned the reasons used for not recommending areas for wilderness classification. And, that the information presented supports additional wilderness classification while benefiting other resources. Two reviewers questioned how the wilderness quality of Deep Creek/Reservoir North would be maintained. Two reviewers felt that although some areas were leased for oil and gas, that it had no bearing on a wilderness recommendation. While another commentator felt that mineral development was unappropriate for recommended wilderness areas. Two commentators questioned why roads could be built in wilderness study areas for subsurface resource uses.

One commentator wanted an additional alternative displayed which is supported by Bob Marshall Alliance and the Rocky Mountain Front Advisory Council. One reviewer questioned the changing of wilderness use levels. They felt the figures were altered to merely justify the Preferred Alternative. One reviewer felt the Plan and DEIS failed to acknowledge or analyze the wilderness opportunities forgone because of oil and gas leasing.

Commentators

PLT-2, RLT-151, RLT-192, RLT-271, RLT-298, RLT-301, RLT-302, RLT-304, RLT-311, RLT-312, RLT-359, and RLT-377.

Response

The detailed reason for major Forest Plan decisions are discussed in the Record of Decision. The Environmental Assessment for leasing in the Deep Creek/Reservoir North area recognizes that if the area is explored for oil and gas, and if some roads are constructed, that the wilderness quality would be reduced from a rating of 28 to 19. However, even with a lower rating the area would have high wilderness values. Wilderness evaluations are made on some of the area recommended for wilderness and the Deep Creek/Reservoir North have existing oil and gas leases with surface occupancy opportunities. It is necessary for the Forest Plan to accommodate this possible use. The Bob Marshall Alliance and Rocky Mountain Front Advisory Council wilderness recommendations is displayed as Alternative I (except for Deep Creek/Reservoir North which is maintained as a further planning area under all alternatives). All information, including wilderness use levels, were updated using current information. All available roadless areas were analyzed for their wilderness suitability.

Concern-
T& E Species

Several reviewers wanted additional information on T&E species protection. They also wanted additional information to assess the impacts on T&E species, especially the grizzly bear. One reviewer wanted the Forest Service biological evaluation completed before the end of the comment period. Some reviewers questioned if the planned actions, especially in the Badger-Two Medicine area, were in compliance with the Endangered Species Act. And, if the cumulative impacts of all activities are being analyzed. A few reviewers questioned the crossing of the Two Medicine River (a suspected grizzly bear travel corridor) despite guidelines to the contrary (L-4).

One reviewer wanted areas where oil and gas development was not compatible with grizzly bears identified. One reviewer felt the proposed Plan minimized impacts, but failed to increase grizzly bear habitat or make existing habitat more secure. One reviewer felt the EIS or Plan did not address the mitigation or effect of adjacent or nearby subdivisions on the grizzly bear. One reviewer questioned if maintaining important bear habitat by natural processes in the wilderness (Revised Plan, page 2-4) meets the requirements of the Endangered Species Act. Two reviewers questioned how the "Yellowstone Guidelines" would be used.

The USDI suggested grizzly augmentation be included in the final EIS and Plan. They also wanted the results of formal consultation with the U.S. Fish and Wildlife Service to be reflected in the final EIS and Plan. One reviewer questioned if the Forest Service had to consult with the U.S. Fish and Wildlife Service only if a biological evaluation shows a "may affect" situation or if it was mandatory for all programs. The reviewer also questioned if direct habitat improvements could be scheduled annually to meet Forest outputs. One reviewer suggested that if any active bald eagle or peregrine falcon nests are found management guidelines should be developed from information from recovery plan teams, not just information from the literature or knowledgeable persons. Two reviewers questioned why there was no information on rare plant species.

Commentators

RLT-20, RLT-86, RLT-93, RLT-126, RLT-144, RLT-151, RLT-240, RLT-271, RLT-302, RLT-311, and RLT-359.

Response

In response to public concern, additional standards have been added to the Forest Plan to protect T&E species. Additional information on T&E species and the effects of Forest program on their habitat has also been added to the FEIS. The biological evaluation was completed and a copy sent to the respondent. However, it was done after the comment period closed. The U.S. Fish and Wildlife Service biological opinion is enclosed in the FEIS as Appendix D. Cumulative effects on T&E species of all activities are being analyzed (see Appendix L, Forest Plan). Management Standard L-4 sets the standards for maintaining grizzly bear corridors, however, it does not preclude roads or other development.

The Forest Service feels that T&E species can be protected through the use of timing and special requirements. However, the cumulative effects analysis process may identify habitat components where surface occupancy must be restricted to prevent adverse effects on T&E species and their habitats.

The Forest Plan does many things for grizzly bears, a threatened species including:

(1) Identify habitat which is critical to the survival of the bear (Management Situation 1).

(2) Establishing standards to promote grizzly bears and their habitat (Management Standard C-2, Forest Plan).

(3) Developing analtical process to assess human activities on grizzly bear and their habitat.

(4) Establishing Management Standards to mitigate the impacts of other activities on T&E species and their habitat (Management Standards A-2, C-2, D-4, E-4, G-1, G-2, and L-4, Forest Plan).

(5) Set direct habitat improvement targets.

In wilderness, the Forest feels that natural processes, especially fire, can maintain important grizzly bear habitat.

The Yellowstone Guidelines were used to stratify occupied grizzly bear habitat (all of the Rocky Mountain Division), and sets the management direction based on this stratification (see Appendix K, Forest Plan). In response to public concern, this information has been added to the Forest Plan (see Management Standard C-2, T&E Species).

The Forest feels that grizzly bear augmentation (the planting or supplementing areas with bear from another area to start or improve a population) is not appropriate until the NCDGBE reaches a recovery level. The Forest Service consults informally with the U.S. Fish and Wildlife on many projects. If the Forest determines that a project may affect a T&E species or their habitat, formal consultation is required. The U.S. Fish and Wildlife Service may also request formal consultation at any time. We feel direct habitat improvement for T&E species should be scheduled yearly. We also recognize that in some years the work may not be accomplished because of such things as weather. We consider recovery plan teams as knowledgeable persons.

In response to public concern, information has been added to the Forest Plan on rare plant species (see Management Standard N-2, Rare Plants).

Concern-Wildlife

The State of Montana felt the hiding cover percentages under Management Area C should be based on the number of roads (open and closed) in a timber compartment, not on a arbitary percentage.

One reviewer questioned the source of the elk data. While another reviewer wanted the input of the Montana Department of Fish, Wildlife, and Parks considered on elk populations. And that, no statement to provide maximum diversity for wildlife was made. Some reviewers questioned wildlife population data, and felt there would be greater impact on elk hunter opportunity than showed by the DEIS-Supplement. Two commentators felt the statement describing elk winter range in the Middle Fork Judith (page 4-67, Revised Proposed Forest Plan) should be revised. The Middle Fork area actually provides an important component of the Judith River elk herd winter range and should be managed accordingly. One reviewer questioned why big horn sheep were not emphasized. While another wanted more information on how elk would be protected.

The State of Montana felt the development of water sources would have little value to wildlife in most mountain or foothill areas and that such development could prove detrimental if livestock were attracted to areas they normally would not frequent.

The State also questioned if the statement on tree opening (2.5 feet) (on page 3-10 in the Forest Plan) was strictly used during calculations of impacts of timber harvest on elk hunting opportunities, the result significantly underestimated the impact potential. Trees that are 2.5 feet high do not provide escape cover. The State also stated that the Forest Plan is in conflict with the Montana Department of Fish, Wildlife, and Parks Statewide Comprehensive Outdoor Recreation Plan (SCORP) that proposes to increase hunter opportunity on this Forest.

The decrease in hunter opportunity is also inconsistent with a number of the Plan's statements that habitat quality will be maintained.

In the State's original comment on the 1982 Plan, they requested that the impact on hunter opportunity be displayed by individual hunting units. This has not been done.

One reviewer questioned maintaining the elk population potential when there was so much logging and roading. One reviewer was impressed with the

amount of wildlife values and wildlife consideration in the Plan. While another reviewer questioned why there was no section for wildlife habitat improvement. One reviewer questioned how the Plan can say forage will remain constant and elk population would not change when future activities will dominate areas.

One reviewer felt the Plan failed to show how the effect of logging and associated road building on big-game cover would be mitigated while another commentator felt the Plan did not provide adequate information to assess the effects of big-game constraints on the Plan's timber harvest level. And, that management practices on the Forest's summer range should have considerably less impact on the elk herd than management practices on adjoining privately owned winter range. One reviewer stated the DEIS-Supplement did not mention, discuss, or itemize "old-growth".

Commentators

RLT-93, RLT-144, RLT-150, RLT-151, RLT-154, RLT-232, RLT-239, RLT-241, RLT-271, RLT-279, RLT-366, and RLT-395.

Response

Hiding cover percentages are based on information from the elk-logging studies, and not arbritary percentages. They have been revised to reflect information from the final study report. Elk data comes from many sources - including information provided by the Department of Fish, Wildlife, and Parks. Information from the Department is considered. However, there is a difference in opinion with the Department and others on the effects of the timber harvest level on elk populations. It is not the intent of the Forest Plan to maximize wildlife diversity.

We appreciate the information on the Middle Fork Judith and the description of elk winter range has been revised in the final Plan. Bighorn sheep were not emphasized because they have limited, but very secure habitat. Management Guidelines for bighorn sheep have been developed and are included as Appendix I.

The Forest recognizes the State's concern with water developments. However, because of extremely dry nature of places like the east Little Belts and Big Snowies, the Forest feels water developments are appropriate.

The minimum definition of a tree opening (2.5 feet) was not used in analyzing hunter opportunity. The Forest recognizes the Forest Plan is in conflict with SCORP. This information has been added to the FEIS.

Habitat quality and hunter opportunity are not directly related. For example, the Sun River Game Preserve provides high elk habitat quality, but no hunter opportunity.

As discussed with the State, the Forest does not have the analytical capabilities to evaluate hunting opportunity on a hunting unit basis. However, the Forest would welcome the opportunity to work with the State on hunting unit objectives so the road management, habitat improvements, and other projects and activities could be coordinated to help meet hunting unit objectives.

Over 65 percent of the Forest will be managed for wilderness, semi-primitive recreation, and wildlife. This, along with maintaining hiding cover and restricting use on roads where timber is harvested will help ensure the elk population potential is maintained. Wildlife habitat improvement is listed in the EIS and Forest Plan. Appendix M has been added which shows the wildlife habitat improvement program. The term "future activities will dominate areas" is made in relative to the visual resource.

An additional standard has been added to C-1 in the Forest Plan to provide for elk hiding cover.

Constraints on the timber harvest level are discussed in detail in the new Appendix B in the Forest Plan.

Elk summer ranges and winter ranges have different needs and objectives and must be managed accordingly to maintain elk habitat quality.

Old-growth is discussed throughout the DEIS-Supplement.

Concern-Interagency Wildlife Guidelines

One reviewer felt that the Interagency Guidelines should be applied to all activities, not just oil and gas activities. While another commentator questioned if the Interagency Guidelines apply to only oil and gas activities. One reviewer wanted

an environmental assessment to explain the effect of any variance of the guidelines. The USDI and the State of Montana pointed out the differences in the Interagency Guidelines and Forest Plan Standards. One commentator stated that violations of the Interagency Guidelines should not be condoned. One reviewer felt the guidelines were too strict and that if work is permitted to start it should be allowed to be finished (in reasonable time) unless a clear and present danger to wildlife actually exists. One commentator did not think people were aware of the far-reaching impacts that the Interagency Guidelines are imposing. The State of Montana suggested that a statement under minerals administration should be added to several management areas applying the Interagency Wildlife Guidelines where applicable.

Commentators

RLT-20, RLT-144, RLT-151, RLT-182, RLT-298, RLT-310, RLT-311, and RLT-395.

Response

The Interagency Guidelines (Appendix I) apply to all activities on the Rocky Mountain Division. The Forest Plan has been changed to reflect this. The standard in the Forest Plan dealing with wildlife (G-1 and G-2) has been eliminated to avoid any confusion. The Forest will rely on the Interagency Guidelines. Violations of the guidelines are not condoned. The Interagency Guidelines have been used for the past three years and have had considerable public review. They were a part of the Proposed Forest Plan issued in 1982. Forest-Wide Standards are to be used throughout the Forest and it is unnecessary to repeat the direction. The Interagency Guidelines are to be used throughout the Rocky Mountain Division.

Concern-
Fish

One commentator felt the number of catchable trout was low. The reviewer also thought the statement in Appendix D, page 10, that fish populations show declines in the more accessible lakes and streams was not correct. The reviewer also stated that contrary to the statement that stocking of lakes is not currently being done, that Sock Lake was stocked every other year. The reviewer also felt that because rainbow trout are the most commonly fished species, it should be listed as a management indicator species. And, that cutthroat trout should be added to the Interagency Wildlife Monitoring/Evaluation Program (Appendix H).

Commentators

RLT-118.

Response

We recognize that catchable trout populations may differ but the population projections were made on the best information available. The fact that fish population are declining applies to the west side of the Bob Marshall. Over the last couple of years, catch limits have been reduced in order to maintain native trout populations. We appreciate the information on Sock Lake. Rainbow trout has been added to the list of indicator species. The suggestion to add the cutthroat trout to the study has been passed on to the Interagency Wildlife Monitoring/Evaluation committee.

Concern-Range

One reviewer felt the statement on page 4-41 of the DEIS-Supplement, "However, transitory range is a minor component of the entire forage resources on the Forest", was in conflict with the statement on page 2-52, which indicates that transitory range may be quite important to AUM increase associated with the Preferred Alternative G. It is commonly accepted among range managers that transitory range cannot be allocated as part of range carrying capacity capability. Both the State of Montana and another reviewer wanted the amount of unsatisfactory range identified.

One commentator also expressed confusion on how transitory range affects the various alternatives. The reviewer also questioned why the range improvement program is operated in new wildernesses.

One reviewer questioned the enhancement of livestock grazing in the Badger-Two Medicine area when Management Standard C-1 states that wildlife needs will be fully met prior to any livestock increase. The State of Montana felt guidelines for preditor and rodent control should be included.

One commentator stated that the Plan omits the actual number of acres presently grazed and the acres projected for future grazing permits. Neither did the Plan present criteria to determine suitable range as it does for timber on the suitable acres available for livestock grazing.

The fact that grazing is barred on only a small portion of the Forest indicates that grazing is actually a management practice included in almost every management area. The designation given to management areas suggested that grazing is far more restrictive than it actually is.

Appendix Q identifies 34,264 acres where grazing is restricted. The commentator questioned if this was the total area in the Forest which is unsuited for or otherwise excluded from this activity.

The Plan must state how increasing forage production and better distribution goals will be accomplished, and how soil and water resources, riparian areas, and T&E species will be protected with increased grazing levels. The feasibility of greater livestock grazing on the Forest was not calculated.

Commentators

RLT-93, RLT-240, RLT-241, RLT-312, and RLT-395.

Response

Both statements are correct. When viewed on a Forest-wide basis, transitory range is only a minor component of the total forage resource. However, additional grazing is dependent on transitory range created through timber harvest and through the use of range improvement, such as fence construction and prescribed burning. Transitory range, which is continually replaced such as through additional timber harvest, is commonly allocated as part of the range carrying capacity. About 20 percent of the suitable range is classified as in fair condition and 1 percent as poor condition and none in very poor condition. This information has been added to the Forest Plan.

Transitory range is a major component of AUMs increase of all of the alternatives.

Grazing, including range improvements, in wilderness governed by the Conference Report to S.2009 (H.R. 96-1126) in the section under "Grazing in National Forest Wilderness Areas" and subsequent Forest Service Manual direction.

Many of the practices to enhance livestock grazing, such as prescribed burning, to increase forage production, also benefits wildlife. The most important aspect is whether the forage is allocated to livestock or to wildlife. It is in this case that wildlife needs will be fully met prior to any livestock increase.

The Plan lists the acres of suitable range that is grazed acres (see Chapter VI). Although some other areas are grazed, they are secondary in nature. The Plan also lists the acres of suitable range on which grazing is excluded to protect other

resources. The listing of the criteria for suitable timber lands is required by the NFMA regulations. Grazing is excluded on about 15 percent of the suitable acres. These are not total acres. Grazing takes place on much of the Forest and throughly and openly discussed throughout the EIS and Plan.

The Plan is not a "how to" document. It sets the goals and objectives for managing the Forest. And, the standards and management direction to accomplish them. The feasibility of increased grazing was carefully evaluated (see Range Benchmark, page 2-9, FEIS).

Concern-Timber

One commentator stated that no evaluation was done in the Plan or EIS on timber market and that the Forest Service should consider holding off timber sales until prices are high enough so that deficit timber sales are not a problem. One commentator felt the Plan did not analyze how much timber demand could be expected from private land. While another commentator thought the real world situation, relative to the timber situation, as a result of the closure of the sawmill at White Sulphur Springs and the necessity to avoid deficit spending, are quite different than displayed in the documents.

One reviewer felt that the departure analysis was inadequate and that departure offers opportunities for increasing early decade harvest and getting on top of the beetle problem. One reviewer stated the Forest Plan still prepetuates the myth that Olney Creek was logged in the 1960s. One reviewer did not feel the long-range effects of logging were identified. And, that the Plan should be more specific about where logging can and will take place.

The State of Montana felt that the use of landtype information may limit areas suitable for timber harvest along the East Front. They also were opposed to using RPA targets as criteria rather than looking at the potential resource degradation. They also questioned if some of the sales in the proposed Forest Plan have just been reclassified as small sales, or if they had been eliminated and new areas added for small sale harvest.

One commentator felt it was difficult to judge how much of the Little Belt timber program will be below cost since projected costs and benefits are aggregated across the Forest.

One reviewer wanted the DEIS and Plan to disclose how many acres of commercial forest land are within "seen areas" and what effect the VQO would have on timber purchasers. One reviewer wanted the total acreage of suitable timber land taken out of production by riparian allocation identified. One reviewer felt the DEIS-Supplement must demonstrate how vegetation munipulation can "enhance or maintain" visual quality. One commentator doubted that Alternative G would accomplish the VQO as indicated.

One commentator felt that the FORPLAN model did not appear to consider the use of firewood nor did the EIS discuss firewood impacts. One reviewer felt the timber potential overstated as the photo interpretation is overly optimistic. While another commentator questioned if timber harvest was practical in Management Area O with the short seasonal operating windows.

The State of Montana questioned if on the Rocky Mountain Division if harvesting would only take place on 10,000 acres, why an additional 33,000 acres would be developed.

One concerned citizen calculated that by 2086 the Forest would run out of suitable timber lands as it takes 120-150 years to grow sawlogs on the Jefferson Division.

Several reviewers including the State of Montana questioned why the 10-year timber program was not shown on the Rocky Mountain Division. One reviewer questioned why Alternative C harvested more steep, low productive sites than Alternative G. Roading and harvesting steeper slopes is going to cause more erosion and water quality degradation. And, that the Plan does not show the negative consequences of increased timber harvest with Alternative G.

Commentators

RLT-20, RLT-34, RLT-39, RLT-67, RLT-126, RLT-154, RLT-194, RLT-241, RLT-275, RLT-301, RLT-375, and RLT-395.

Response

All timber sales over 1 million board feet will receive further economic evaluation. The option to hold off below cost sales until market conditions

improve will be considered. The Forest has reanalyzed the supply of timber, including timber from private lands (see Chapter III, FEIS). This section has also been updated.

The Forest reviewed two departure alternatives, although departure was not selected as the Preferred Alternative. Mountain pine beetle is a "potential" problem, as about 200,000 acres has been identified as high risk stands to the mountain pine beetle. The Olney Creek sale on the Rocky Mountain Division was sold in the 1960s although the area was never harvested. The information has been corrected in the final Plan. The Plan is site-specific for timber harvest in the first decade and area-specific throughout the planning period.

Landtype information is used for all soil disturbing activities including timber harvest. Landtype information was used to help determine timber suitability throughout the Forest. RPA targets were not used as criteria, but were used to help define the range of alternatives and resource potentials. All sales on the Rocky Mountain Division were reclassified as small sales. The sale had restrictions so they could not exceed .5 million board feet. The area available for regulated timber harvest has been reduced.

The Little Belt Divide is highly suited to timber management, and most stands have a positive value. However, because of the many variables it is impossible to determine if a sale is below cost until the individual economic analysis is completed. Additional information on various constraints on timber harvest level, has been included in Appendix B.

Visual management and timber harvest including enhancement and maintenance is throughly discussed in National Forest Landscape Management 2:50 (Timber), USDA, Forest Service, 1980.

The Forest feels that the Preferred Alternative (G) will accomplish the VQO as indicated.

FORPLAN treats firewood as mortality. Additional information has been added to the FEIS on firewood removal. The Forest Plan uses the best information available. As new data, such as timber information becomes available, it will be used to validate

Forest Plan resource information and serve as basis for the next Plan. Timber harvest in Management Area 0 has been changed.

The actual acres where harvesting will take place was 13,000 acres, the other 30,000 acres would be affected by the development of these acres.

Under the Preferred Alternative (G), the Forest Plan shows the rotation age of 90 years for lodgepole pine, and 120 years for Douglas fir.

Only supervisor sales are shown on the 10-year program. The remainder of the sales are sold under District Ranger authority. Alternative C harvests more timber on low productive sites in response to high levels of wildlife habitat improvement.

The EIS discloses all of the effects of Alternative G, including the negative consequences of increased timber harvest.

Concern-
Oil and Gas

Several commentators felt a full, site-specific EIS should be written on each and every project. And, that each EIS should consider the relationships of specific ecosystems. One commentator wanted both the Endangered Species Act and NEPA satified before any further energy exploration or development is allowed. While another felt Chapter IV of the EIS discussed oil and gas development term, site-specific effects are not addressed and are not adequate basis for oil and gas decision-making.

The USDI felt the Plan did not make it clear that if a specific area is to be developed that a cumulative environmental impact at full field developed will be throughly analyzed, and if needed, an EIS will be prepared. One reviewer felt the DEIS did not display the full magnitude of oil and gas development. One commentator wanted the expected effects of oil and gas production discussed. One reviewer did not agree with the rationale that lands over 60 percent slope recommended for wilderness impression classification would not have a significant effect on oil and gas opportunity.

Two commentators felt the discussion on "sour gas" was inadequate. One commentator wanted the constraints on oil and gas developed and the mechanisics for applying and enforcing them discussed in

more detail. While another reviewer felt Forest officals have given the impresssion that lease development cannot be denied, yet the Hall Creek Environmental Assessment claims otherwise. One commentator felt that there were too many restrictions on surface occupancy and that more flexibility is needed, and new innovative techniques should be allowed. The reviewer felt they should be available for leasing, even if no-surface occupancy stipulations were used. One commentator questioned what studies were used for no-surface occupancy decisions.

One commentator thought the influence of seismic testing and leasing should be established as one of the management objectives of the Forest. One reviewer felt that the USDI Solicitors General's Opinion on, "First in time, first in right", means that traditional uses such as hunting and fishing have prior legal rights and cannot be excluded for energy development.

One commentator felt the Forest Service was not showing enough concern for the long-term energy needs of the nation. And, that the "Further Planning" stipulation hinders the planning of oil and gas operations.

Two reviewers stated that the Forest had no standards for recommending "no lease" or "no-surface occupancy" in areas not already leased or when leases expire. One commentator thought lease development should be denied when more than one wildlife species is impacted. Several reviewers felt the Lewis and Clark National Forest was biased toward pro-industry because they used data from oil and gas companies rather than the U.S. Geological Survey in assessing the oil and gas potential.

One commentator wanted the potential for energy resource development, particulary renewable resources, addressed.

Commentators

OCB-3, OCB-4, RLT-16, RLT-36, RLT-144, RLT-151, RLT-182, RLT-192, RLT-198, RLT-226, RLT-229, RLT-236, RLT-237, RLT-240, RLT-271, RLT-301, RLT-304, RLT-311, RLT-377, RLT-396, RLT-397, and RLT-399.

Response

In response to the USDI and other public concerns, additional information dealing with the environmental analysis process has been added to the FEIS and

final Plan. Energy exploration and development must be done in conformance with both the Endangered Species Act and NEPA.

The Forest Plan/EIS does not attempt to disclose the full magnitude of possible oil and gas development and production. Nor is it an approval document for such decisions. Approval for oil and gas leases and development projects is done through environmental analysis and its documentation is appropriate NEPA documents (EIS or Environmental Assessment). Should discoveries be made, a field development EIS or Environmental Assessment will be issued.

The Forest Plan/EIS outlines the oil and gas leasing and exploration programs, discloses the effects of these programs, and set the standards for these activities.

Additional information of foregone oil and gas opportunities because of wilderness classification, has been added to the FEIS.

Additional information on "sour gas" has been added to the FEIS.

The Forest Plan is not a "how to" document and is not the proper place to discuss how standards on oil and gas development are applied or enforced.

Application to drill can be denied based on appropriate environmental reasons, including the protection of T&E species and their habitat.

All of the nonwilderness and RARE II recommended wilderness lands on the Rocky Mountain Division have been leased. The Forest feels that the stipulations applied to these leases are appropriate to protect surface resources. No-surface occupancy decisions are based on the ability of the land and surface resources to sustain such uses. For example, slopes exceeding 60 percent are not available for surface occupancy.

The Forest does not feel that determining the effects of seismic testing and leasing should be a management objective of the Forest. However, the Forest is committed to the monitoring and evaluation of oil and gas activities on other resources (see Chapter VI and Appendix L of the Forest Plan). Other resources such as wildlife, water, soils, and recreation, all have management objectives which must be met.

The Forest feels the "First in time, first in right" applies to logal mandated rights, not other uses of National Forests.

The Forest is committed to managing, accommodating, and facilitating the exploration, development, and production of mineral resources in keeping with National policy. Likewise, the Forest is equally committed to protecting surface resources, which are defined by law and National policy.

When wildlife timing restrictions do not allow a reasonable time period or window to develop a lease, no-surface occupancy is recommended. This conveys some rights to the lease and still protects surface resources. If the lessee should decline to accept a non-occupancy lease, the lease will be denied. The Forest feels that they should use the "best" professional information available including information from the oil and gas industry, professional Geologic Associations, U.S. Geological Survey, and the Montana Bureau of Mines and Geology when evaluating any resource potential.

The Forest has addressed the potential for energy resources where they are a Forest Plan issue.

Concern-
Worse Case-
Cumulative Effects

Two reviewers stated there was a need for a worse case analysis. One commentator felt that the potential to force grizzlies into situations which could lead to their death and therefore the Plan was illegal. They also questioned the validity and/or quantification of information used in the cumulative effects process. The commentator also felt there was a need to map grizzly bear habitat prior to planning road construction and other activities.

One commentator was concerned that there was no discussion of the cumulative effects of multiple lease actions or of development on a large scale.

Commentators

RLT-60, RLT-86, and RLT-271.

Response

NEPA is very specific when a worse case analysis is needed.

We feel that adverse impacts of Forest activities are well documented and that a worse case analysis is not appropriate. When more site-specific information is obtained about a proposal, a more

meaningful analysis can be conducted through established NEPA procedures. We know of no situation where activities under the Plan would directly lead to a grizzly bear mortality. The cumulative effects process, an interagency effort, is using the best information. As with a model, there is a continuing need to validate the information used. A major effort is underway to complete the habitat component mapping on the Forest. All proposed activities are being evaluated using the cumulative effects process. No multiple lease actions or large scale development has been proposed.

Concern-
Soil and Water

One reviewer stated the Forest lacks site-specific information needed to apply regional sediment yield models to the Lewis and Clark. And, that the Forest must make an immediate commitment to develop the necessary data base so that future impacts may be evaluated. One reviewer felt that is would be logical to gather baseline data prior to the approval of any oil and gas development or implementation of the Forest Plan.

Some commentators questioned the use of sediment models to determine the effect of logging and road building. One commentator commented that hydrologists could not agree how much effect, if any, timber harvest had on water yield and sediment production. One reviewer wanted "stream" defined.

Other reviewers wanted water and sediment yields calculated by individual watersheds or by mountain range. One commentator stated that the DEIS-Supplement does not say how much sediment increase is attributed to timber as opposed to grazing and other uses. Or, how water quality concerns affect the land allocations selected for the preferred alternatives. One reviewer stated that there are inconsistencies and contradictions in sediment yields between the DEIS and the DEIS-Supplement.

Some commentators supported all water quality protection measures. The State of Montana strongly supported the commitment in the proposed Plan for consultation with the Department of Fish, Wildlife, and Parks, and Water Quality Bureau. However, they felt there were inconsistencies in sediment yields. For example, the Plan states only a 1 percent

increase in sediment, yet the DEIS-Supplement shows that sediment will increase from 37,000 tons per year to 41,200 tons per year, a 10.3 percent increase.

One commentator questioned if the statement, "All restoration to control management-caused erosion would be completed by the year 1995", means that after the year 1995 there will be no management-caused erosion with any alternative. One reviewer stated that perhaps the statement, "Irrigation is the most important economic use of water, but it is incomplete because it does not express the importance of recreational values (DEIS, page 3-14).

Also lacking are comments of how alternatives will affect water quality and quantity and timing and duration of peak flows. One commentator felt the Forest Service should also consider stopping projects if needed to protect water quality.

One commentator questioned if harvesting nine percent of the steep, low productivity sites on the Jefferson Division was worth the potential adverse water quality impacts.

Commentators

RLT-20, RLT-126, RLT-226, RLT-241, RLT-306, RLT-308, RLT-312, and RLT-395.

Response

Sediment was calculated by the method given in the document, "Sediment Production for Long Range Planning," USDA-Forest Service, Northern and Intermountain Regions. This information was reviewed for the final EIS.

Although a regional sediment model was used to project sediment increases, it was adjusted to reflect local conditions. Accuracy or reliability of these estimates are poor. The data can be used for comparison between alternatives, not as an absolute measurement. Sediment is a natural part of the environment, but is highly variable seasonally and from year to year (sometimes this difference exceeds 1000 percent).

The huge variation in sediment indicates that "baseline" data may not be of great help except in a research situation. An upstream-vs.-downstream sampling and careful review of apparent effectiveness of management effects will provide an adequate basis for evaluation of impacts. Additional sampling will help in improving the accuracy of the model.

In response to public concern, additional information on sediment models has been added to the FEIS. While hydrologists do differ on the amount of water yield and sediment produced, the research is quite clear that timber harvest and associated road construction increases water yields and sedimentation.

A stream is usually defined as any flowing water. Perennial streams flow water continuously throughout most years.

Water yield and sediment increase is required on individual projects as appropriate (see Management Standard F-3, Soil and Water, Forest Plan).

In response to public concern, the Forest estimated sediment yields for major drainages where the most road construction and timber harvest will occur (see Public Comment-DEIS-Soil and Water, this chapter). These sediment increases varied from less than zero to six percent. These projected increases should not decrease survival of salmonids within the Forest. However, in low gradient sections of streams off the forest where sedimentation is the factor limiting reproductive success, it is likely that there will be decreases of up to five percent in over winter survival of young of the year fish. The reduction in survival of young fish will translate into a similar reduction of adult trout over a few years. About 50 percent of the projected increase in sediment yield is attributed to timber harvest and associated road construction, and 50 percent to grazing.

Water quality concern was not a major reason for land allocation decisions. Sediment yield was re-evaluated in the DEIS-Supplement (see page 2-68).

The Forest appreciates the support for any measures to protect water quality. The 37,000 tons per year is the base sediment yield that would occur if there were no roads, logging, or livestock grazing. These uses have occurred for nearly a century; current sediment yield is estimated at about 10 percent greater to begin with because of existing roads, grazing, and other activities. By 2030, under the Current Plan, 39.9 thousand tons of sediment would be produced. The Preferred Alternative is projected to increase sediment to 40.4 thousand tons. Thus the 1 percent increase over the current level.

The statement "All erosion control measures...." means that the backlog of restoration needs will be completed by 1995. The importance of other uses of water has been added to the discussion in Chapter III of the FEIS. Management-caused erosion will continue with any alternative; however, all reasonable soil and water conservation practices will be applied.

Additional information on water quality and quantity and timing and duration of peak flows has been added to the FEIS.

The nine percent of the steep, low productivity sites are interdispersed with other more productive sites or already accessed by road. The Forest feels that these areas can be developed without adverse water quality impacts. Water quality monitoring is discussed under Monitoring in this section.

Concern-Lands

One reviewer felt the opportunity for land ownership adjustment should be considered in more detail and incorporated into the final Plan. A more detailed discussion on managing intermingled private lands should also be included in the FEIS.

Commentators

RLT-126.

Response

The Forest feels that Appendix B, Land Exchange, describes the detailed Land Exchange Program. Additional information on managing intermingled private lands has been included in the FEIS.

Concern-Facilities

The State of Montana and other commentators stated that the Plan does not reflect all of the potential road locations for oil and gas development, especially in the Badger-Two Medicine area. They also felt the need for the public review of any road locations not shown on the Forest Plan maps. One commentator questioned the statement on page 2-15 which describes an additional 875 miles of roads to be built, however road construction figures on Table 2.1 are much less.

One reviewer questioned the construction of roads in the Badger-Two Medicine area when Appendix O calls for the use of existing roads. Another reviewer felt the recent Jersey Jack decision required the Forest Service to prepare an EIS before roads were built into a roadless area.

The State of Montana pointed out that the Forest Plan Overview document eludes to the 110 miles of collector roads that will be constructed over the next 50 years, but fails to mention the 763 miles of local roads that will be built. One commentator wanted the terms "arterial roads" and "collector roads" and "local roads" defined. Another reviewer wanted roads expressed in some common unit, such as miles of road per square mile of National Forest land. And, that roads constructed under the "most likely" and "large discovery" scenarios be displayed. One reviewer questioned the differences in road mileage and right-of-way when some alternatives harvest the same amount of timber.

Commentators

RLT-86, RLT-118, RLT-151, RLT-194, RLT-226, RLT-241, RLT-301, RLT-306, RLT-312, and RLT-395.

Response

The Forest Plan only shows arterial and collector road corridors. It does not attempt to show all potential road locations. Area and project analysis are additional planning levels to which the more site-specific aspect of a project would be identified and displayed prior to actual implementation. Public involvement is a part of project implementation of all activities including new road construction.

The specific reference in Appendix O refers to road and trail management, not new road construction. The Jersey Jack decision because there was significant impact, required the preparation of an EIS. Each roadless area will have to be evaluated on its own merits.

The "Overview" did not identify the arterial and collector road system. The final "Overview" will include both systems. "Arterial road", "collector roads", and "local roads" are defined in the Glossary. The Forest feels that the total road system is more appropriate than miles of road per square mile of land. Roads that may be constructed under the "most likely" and "large discovery" scenarios have been added to the FEIS. Road mileage and right-of-way needs are based on where the timber will be harvested, as well as the total volume.

Concern-Protection-Insect and Disease

One reviewer questioned if the Forest Service has the data to support using timber harvest for controlling insects and disease.

Commentators

RLT-239.

Response

The use of timber harvest to lessen the risks of insects and disease is well documented in research literature.

Concern-Protection-Fire

The DEIS does not adequately display the risk of catastrophic fire, especially the effect on water quality and fisheries. The Proposed Plan does not take the risk into account.

Commentators

RLT-126.

Response

The risk of fire is discussed as Chapter IV in the EIS. The Sandpoint fire in the Lost Fork of the Judith this past summer emphasizes this concern. Further information can be found in the Planning Records, Level I and III Fire Analysis, Lewis and Clark National Forest.

Concern-Economics

One commentator felt the DEIS-Supplement failed to support the preferred alternative since it failed to incorporate the economic data upon which the economic analysis was based. One reviewer wanted the average 25 percent payment to the counties displayed by alternative. The reviewer also felt that the change in employment did not consider that no single mill could secure adequate timber to support a single-shift production level. And, the economic consequences to the social environment will be substantially more than anticipated.

One commentator felt the Plan did not evaluate the negative impacts to central Montana that will result from decreased wildlife related recreation. One reviewer questioned how economic impacts are evaluated.

Some commentators felt that the Plan did not adequately address below cost sales. Two reviewers felt that the Plan/EIS was not clear in explaining why timber harvest levels are being allowed to rise so drastically when timber sales do not recover costs. Two commentators questioned the PNV calculations as they thought timber values were above the Regional averages.

One commentator questioned that given the negative cost ratio, how the Forest could calculate that the more timber cut the higher the PNV. And, if other benefits were derived from harvest activities they should be identified.

The State of Montana felt that secondary employment resulting from oil and gas is overstated and should be re-evaluated.

Two commentators, including the State of Montana, felt the Lewis and Clark could not harvest timber where financially efficient considering direct timber costs and benefits as stated in the Plan. And, if harvesting for other multiple-use purposes this needs to be clarified by (1) running FORPLAN using only timber costs and receipts with an objective function of maximizing PNV and (2) delineating lands with a positive and a negative PNV for timber. They also wanted the rationale for harvesting timber on lands with a negative PNV listed.

One reviewer pointed out that Figure 2.27 in the DEIS-Supplement disagrees with Table 4.1 on projected income changes. Also Alternative H recommends the most additional wilderness, but proposes only slightly more timber harvest than the Preferred Alternative G. Yet Alternative H shows more than 10 times greater employment opportunity and nearly a 15 fold increase in income.

Commentators

RLT-16, RLT-18, RLT-60, RLT-93, RLT-239, RLT-241, RLT-271, RLT-312, and RLT-375.

Response

The data to develop the economic analysis for all alternatives, including the preferred alternative, was summarized in the DEIS. The detailed information can be found in the planning record, "Economic Data and Analysis". The 25 percent payment was displayed in Table 2.11 in the DEIS-Supplement.

The change in employment and income is based on the economic outputs from the Forest. This analysis includes changes in hunter visitor days.

Below cost sales are discussed under Economics, this section.

Timber values were based on the cost of sawlogs delivered at the mill. Timber values were assumed to increase in real terms during the first five decades. For the remaining period, these values remained constant. They are based on actual prices of sawlogs from the Lewis and Clark National Forest.

We have reviewed Figure 2.27 with Table 4.1 and cannot identify any discrepancies. Income and employment, while heavily influenced by the timber harvest level, consider the total outputs of the alternatives.

The Forest Plan did not analyze cost/benefit ratios. Timber from the Forest has a positive value.

Secondary employment for oil and gas was re-evaluated, but no changes were made.

Financially efficient does not mean that each and every timber sale will make money for the government. Financially efficient means timber is produced in the most cost effective way. This is why only 9 percent of the roadless lands on the Forest will be developed under the Plan.

The type of analysis described including identifying stands with positive and negative values, have been completed. In response to this and other concerns, additional economic analysis requirements for each sale over 1 million board feet has been added to the Forest Plan (see Management Standard E-4, Timber Harvest, Forest Plan).

Concern-Benchmarks

The National Wildlife Federation questioned the fact that no benchmarks were developed without constraints. They felt that by developing all benchmarks with constraints, the Forest Service failed to properly address wilderness, recreation, and T&E species issues and opportunities. (219.12E(i)iiiD) One reviewer questioned why it was necessary to reduce domestic grazing under the Maximum Elk Benchmark. And, that merely providing more winter range will not automatically increase elk numbers.

The reviewer also questioned the legality of the Maximum Timber Benchmark when "moderate" outputs reduce other resources which is a clear violation of NFMA regulations.

Commentators

RLT-241 and RLT-312.

Response

Benchmarks have to use some constraints in order for them to be realistic. Benchmarks were developed constraints with National planning direction which was established to be responsive to NFMA regulations.

The Maximum Elk Benchmark eliminates grazing on winter ranges, thusly the reduction in domestic grazing. The Forest realizes that elk numbers will not increase automatically, and therefore, refers to "elk population potentials".

The NFMA regulations defines, "sustained-yield of products and services" as, "the achievement and maintenance in perpetuity of a high level annual or regulated periodic output of the various renewable resources of the National Forest System without impairment of the productivity of the land". The Maximum Timber Benchmark complies with this definition.

Concern-Alternatives

Two commentators questioned why no alternative considered timber and range output significantly below current levels was studied in detail. They and other reviewers questioned why there was not a clear statement explaining why Alternative G is the Preferred Alternative.

One reviewer wanted an alternative added which is supported by the Bob Marshall Alliance and the Rocky Mountain Front Advisory Council.

One commentator questioned the statement on page 4-31 in the DEIS-Supplement that said Alternatives C, H, and K would affect private lands. The commentator felt this was an effort to discourage support for these alternatives and to discredit the the Department of Fish, Wildlife, and Parks by saying they will not or cannot control elk numbers to avoid conflicts. The reviewer also felt that Alternative F should be added to the list of alternatives where range and big-game habitat would be in conflict. The commentator also questioned why Alternative C was so different from Alternative K and the Current Plan when the timber harvest levels are the same. And why does the Plan say the timber harvest would remain at the same level under Alternative H when it actually nearly doubles. The commentator also pointed out discrepancies in roadless acreage between Tables 2.2 and 4.1.

One reviewer felt the Preferred Alternative did not consider the departure analysis. The State of Montana questioned why there was no discussion of sale locations under the departure alternative, and felt that departure should not take place on the Rocky Mountain Division. One concerned citizen

thought that departure was selected as the preferred alternative. The reviewer also felt that the merit of each alternative with a harvest rate similar to the Current Plan is systematically degraded by a decrease in livestock grazing and increases in elk numbers with the inference that more elk will evolve and conflict with private landowners. Commentators also questioned why other alternatives were not formulated.

Commentators

RLT-118, RLT-151, RLT-239, RLT-241, RLT-312, and RLT-395.

Response

Alternatives with timber and grazing outputs significantly below current levels, were considered during alternative formulation and dismissed. These levels have been historically produced by the Forest.

The Forest feels Alternative G maximizes net public benefit. The reason for this are found throughout the EIS and are described in detail in the Record of Decision.

Alternative I reflects Alternative W which is supported by the Bob Marshall Alliance and the Rocky Mountain Front Advisory Council. However, Deep Creek/Reservoir North is treated as a further planning area in all alternatives.

The Forest feels that under these alternatives, elk numbers will increase and thusly private lands will be affected. It is not meant to discourage support for these alternatives or discredit the Department of Fish, Wildlife, and Parks. However, sometimes control of elk populations can be difficult for any wildlife management agency.

The Forest agrees and Alternative F has been added to the list of alternatives where range and big-game habitat would be in conflict.

The timber harvest level is only part of an alternative. Other objectives and constraints and that fact the model is seeking to maximize present net values lead to differences. The DEIS-Supplement lists the timber harvest for Alternative H on page 2-55. We appreciate the noted descrepancies in roadless acreage. They have been corrected in the FEIS.

Under departure, the regulated timber harvest areas are the same. Only the harvest level is increased in earlier decades. Departure is not planned for the Rocky Mountain or Jefferson Division. Departure was not selected as the Preferred Alternative.

Alternatives (16) were formulated to provide a reasonable range of alternatives that could be analyzed within the capability of the Forest and that were responsive to public issues and management concerns. The effect of the alternatives were made and evaluated by the Interdisciplinary Planning Team. They were not made to degrade any alternative.

The information on timber harvest level for Alternative H on page 2-28 is in error, as the timber harvest nearly doubles. This information has been corrected in the FEIS.

Concern-
Management Guidelines

The State of Montana felt that in a number of places the Forest-Wide Management Guidelines are in need of revision and or updating. They listed several suggestions for improving the guidelines.

The State of Montana also felt that if the Forest intends to comply with the Interagency Guidelines, a number of changes are needed in Management Guideline G-1, Seismic Exploration, and G-2, Oil and Gas Leasing, Exploratory Drilling, Field Development, and Production. They listed the changes they felt were necessary. The State also felt that item 21, G-1, indicating the District Ranger may allow seismic activity during the general big-game hunting season should be addressed as set forth in the "Environmental Assessment Geophysical Exploration Nonwilderness Lands - Lewis and Clark National Forest". They went on to say the Forest may have areas designated where roads built for oil and gas will be used to "manage surface resources", they felt that if the Forest intends to expand the management of surface resources following road construction, these areas should be described in the Plan. They also thought item 2, G-1, should restrict occupancy within the flood plain, not just "within the vicinity of (generally 100 feet) the stream".

One commentator suggested making horse logging "mandatory where feasible" instead of merely encouraging it (Management Standard E-4). One concerned citizen listed several statements from the

planning document, "Management Guideline Analysis Report." The reviewer stated that the Forest had violated these guidelines. One commentator felt that meeting water quality standards were too restrictive. One reviewer questioned the use of crew camps and permitting seismic exploration during the hunting season. One reviewer thought that Management Standard G-1 was too restrictive. One commentator felt Management Standard G-3, Mineral Withdrawal, should mention wildlife, watershed, or air quality resources that exist in areas currently withdrawn from mineral entry.

One commentator felt the fire specific guidelines were deleted from the original proposed Forest Plan because the Forest Service cannot reconcile them with the massive oil and gas exploration on the Forest.

One reviewer thought the standard for an opening in Management Areas B and O should be 6 feet, not 2.5 feet. And, that the standards for timber harvest should include road closures as one of the measures to minimize disturbance to grizzly bears.

One reviewer wanted the standard to locate slash piles away from riparian areas reworded to be more specific. And, to allow yarding across streams only if the logs are suspended. One commentator wanted the standards for debris control to be more specific on protecting certain soil types.

Commentators

RLT-20, RLT-151, RLT-182, RLT-240, RLT-241, RLT-246, RLT-311, and RLT-395.

Response

In response to the State's concern, the Forest-Wide Management "Standards" have been revised and updated, including G-1 and G-2. Seismic activity will not be permitted during the general big-game season. Areas where oil and gas roads will be used to manage surface resource are identified in the Forest Plan. On the Rocky Mountain Division it is Management Area O.

The Forest does not feel making horse logging "mandatory where feasible" is appropriate. The "Management Guideline Analysis Report" is part of the planning record. The standards and management direction is listed in the Forest Plan.

The Forest feels that the water quality standards are necessary to maintain water quality.

Crew camps will only be used as a mitigation measure to protect grizzly bear habitat in accordance with Interagency Guidelines.

The Forest has been operating under standards in G-1 for the past three years, in 1984 over 300 miles of seismic line was completed. The Forest feels these standards are necessary to protect other resources.

The intent of Management Standard G-3 is to set the criteria when mineral withdrawal will be used, not to describe the resources in these areas.

The standard to locate slash piles away from riparian areas was not changed to allow the flexibility needed to protect riparian and disposal of slash. The standard dealing with yarding logs across streams has been changed as suggested. Soil types are given the highest consideration in slash disposal, however, they are not listed in the Forest Plan.

The fire management guidelines were eliminated because they were no longer applicable, not because they were in conflict with oil and gas activities.

Concern-General

One reviewer questioned why the County Commissioners from Meagher and Wheatland Counties were not contacted concerning the Forest Plan. One reviewer did not believe that the Forest Service can honestly claim that the character of the Forest will not change despite development, when the impact of oil and gas development has not been addressed.

The USDI felt that the EIS and Plan should set specific criteria on development thresholds which will trigger an EIS. While other commentators urged continued future public review of the Plan. The Montana Wilderness Association had several suggestions to improve the educational efforts of the Plan.

A few commentators stated that it was difficult for the public to comprehend the volume of material and data that comprises the Forest Plan. One reviewer cited a lack of literature citations. Two reviewers reflected the comment period was too short. While another questioned which document controls a given issue.

One reviewer commented on the technical inadequacies of the EIS including (1) need for complete citations in "main glossary", (2) need for a subject index, (3) need to respond to all substantive comments with attachments of such comments to the FEIS, (4) need interdisciplinary coordination with land and resource planning efforts of other Federal and State agencies, (5) Chapter IV, (6) FORPLAN analysis, (7) scoping process, (8) purpose and need for action, (9) responsibilities and identifications of people responsible for the EIS, (10) unresolved differences and areas of controversy raised by affected agencies, (11) environmental amenities and values are given appropriate consideration and, (12) failure to discuss implementation of monitoring and evaluation as a reasonable means to mitigate adverse impacts.

One reviewer listed several statements from the DEIS that the reviewer thought were in conflict with wildlife and fish habitat objectives.

Commentators

RLT-86, RLT-93, RLT-144, RLT-185, RLT-195, RLT-197, RLT-234, RLT-241, RLT-288, RLT-312, and RLT-375.

Response

All thirteen Board of County Commissioners were contacted during the Forest Planning process.

The Forest Plan describes the changes to the Forest, including the changes as a result of oil and gas development.

NEPA regulations provide the direction as to when an EIS is needed. Most all of the suggestions of the Montana Wilderness Association to improve the educational efforts have been incorporated into the final Plan.

The Forest Plan is scheduled for revision every 10-15 years. It may be amended or revised as needed. Public involvement is a part of these processes. The Forest realizes the volumous and technical nature of Forest Planning material. An "Overview" was prepared to aid people in the review of the Forest Plan. The 90-day comment period was extended an additional 30 days in response to public requests. The Forest has reviewed the listed statements, and where appropriate changes have been made.

As was stated, the DEIS-Supplement is an addition to the DEIS issued in 1982. While the Revised Proposed Forest Plan replaces in total the Proposed Plan.

The Forest has reviewed the technical inadequacies, but feels the EIS is in full compliance with NEPA procedures and regulations.

Concern-Monitoring

Some reviewers were concerned with monitoring the Forest Plan. A few commentators expressed concern with adequate funding for monitoring activities. While other commentators felt the monitoring plan should be improved. Still other commentators felt the monitoring plan should be implemented before any development takes place.

A few reviewers questioned the Forest's ability to adequately monitor activities, especially the interagency guidelines. One reviewer questioned how the planned frequency of monitoring compared to the existing data collection. The State of Montana felt that many of the programs proposed to monitor the effects of timber harvest are inadequate to accomplish the stated goals.

The State and the Environmental Protection Agency supported additional watershed and water quality monitoring.

Two reviewers questioned the monitoring frequency of grazing in riparian areas. One reviewer felt monitoring of range conditions and trend should not be done until all allotment plans have been completed. While two other reviewers questioned the ability of the Forest Service to monitor management indicator and other wildlife species. And, wanted individual watersheds or other site-specific action monitored. Some reviewers were concerned with oil and gas monitoring and that adequate money and manpower be guaranteed for these important activities including road closures.

One commentator wanted the monitoring done by an impartial agency.

The State of Montana wanted improved monitoring to minimize the effects of timber harvest on water quality.

Commentators

OCB-13, OCB-15, FLT-3, RLT-39, RLT-86, RLT-119, RLT-149, RLT-173, RLT-191, RLT-226, RLT-234, RLT-306, RLT-311, RLT-312, RLT-375, RLT-395, and RLT-396.

Response

The Monitoring Plan has been carefully reviewed and some changes have been made. The water monitoring section has been revised. Funding for monitoring is tied to many resource programs and will have the highest priority for Forest Plan implementation. Monitoring has been a part of many Forest activities. However, the Forest Plan formalizes and strengthens this program, establishes a educational procedure, and informs the public of the results.

The Forest feels it has the ability to monitor activities, and to administer permits which use the Interagency Guidelines. Generally, the Forest Plan Monitoring Plan has a higher frequency of monitoring compared to existing data collection.

Range condition and trend must be monitored to evaluate the range program. The amount of grazing in riparian is checked through the administration of grazing permits.

Wildlife species are some of the most difficult to monitor. The Forest has proposed a reasonable way to monitor such species and still be cost effective.

Most all water monitoring is done on a sample basis. Past water quality monitoring has consisted of data collection, first of broad sampling of mostly common chemical parameters, then of intensive sampling of sediment and related characteristics. These types of data have always been difficult to analyze and to apply and are also expensive, time-consuming, and requires years of data collection because of extreme year-to-year variation.

Monitoring of water quality prior to 1972 was limited to a very few samples of turbidity or suspended sediment, insufficient to describe any streams or effects. A monitoring program between 1972 and 1978 involved the field measurement of common chemical parameters at 31 stations. This program allowed a very general characterization of the basic chemical water quality of the streams of the Jefferson Division.

Suspended sediment is now recognized as the parameter most likely to be affected by management activities. The monitoring program between 1979 and 1983 used automatic sampling of sediment (turbidity) at six stations on both the Jefferson Division and the Rocky Mountain Division. Samples were collected automatically every six hours during the high-flow season. This program will continue in the future as specific project needs for monitoring are identified.

The current Forest water quality monitoring program is outlined in items C-11, and F-1 through F-9 of Chapter VI of the final Forest Plan. Water quality monitoring now includes (or even emphasizes) field reviews to assure the use of Best Management Practices and to assure that project areas are promptly stabilized and revegetated. Verification of water quality protection by sampling of streams is also used to help quantify the effects of critical projects.

The Forest Service usually collects water quality samples, however the testing is done by certified or states agencies.

In response to public concern, the section on water quality monitoring has been strengthened. The Forest has discussed and resolved with the State of Montana their concerns.

FEIS-MAILING LIST

The Record of Decision and Forest Plan "Overview" will be sent to all commentators along with a copy of their comments and the Forest Service response (See Appendices E and F for a list of commentators). The Record of Decision, Forest Plan "Overview", FEIS, and Forest Plan will be sent to the following agencies, organizations, elected officials, and individuals (as requested).

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FEIS
Glossary

GLOSSARY

A

Access	See Public Access.
Acre-Equivalent (AE)	A unit of habitat related to fish or wildlife habitat improvement projects. Acre equivalents are the acres of habitat that are influenced by an acre of that is actually modified by the project. For example, an acre of winter range burned is credited with influencing 4 acres of summer range.
Acre-Foot	A measure of water or sediment volume equal to the amount which would cover an area of 1 acre to a depth of 1 foot i.e. 325,851 gallons or 43,560 cubic feet (Thor, Edward C. PSW Forest and Range Experiment Station).
Activity Fuels	Fuels which have been directly generated or altered by management activities (FSM 5150).
Administrative Facilities	Those facilities, such as ranger stations, work centers, and cabins, which are used by the Forest Service in the management of the National Forest.
Affected Environment	The biological and physical environment and the relationship of people to that environment that will or may be changed by proposed actions.
Allocation	The assignment of management prescriptions to particular land areas to achieve the goals and objectives of the alternatives.
Allocation Model	See Resource Allocation Model.
Allotment	See Range Allotment.
Allowable Sale Quantity	The quantity of timber that may be sold from the suitable land covered by the Forest Plan for a time period specified by the plan. This quantity is usually expressed on an annual basis as the average annual allowable sale quantity (NFMA Planning 36 CFR 219.3).
Alternative	A combination of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives. One of several policies, plans, or projects proposed for decisionmaking. An alternative need not substitute for another in all respects.

GLOSSARY

Analysis Area	One or more capability areas combined for the purpose of analysis in formulating alternatives and estimating various impacts and effects.
Analysis of the Management Situation	A determination of the ability of the planning area to supply goods and services in response to society's demand for those goods and services.
Animal Unit Month (AUM)	The quantity of forage required by one mature cow (1,000 lbs.) or the equivalent for one month (Dryland, 1973).
Annual Forest Program	The summary of aggregation of all projects for a given year that, for a given level of funding, make up an integrated (multi-functional) course of action on a Forest planning area.
Arterial Roads	Roads comprising the basic access network for National Forest System administrative and management activities. These roads serve all resources and maintenance is not normally determined by the activities of any one resource. They provide service to large areas and usually connect with public highways or other Forest arterial roads, to form an integrated network of primary travel routes. The location and standard are often determined by a demand for maximum mobility and travel efficiency, rather than by a specific resource management service. Usually arterial roads are developed and operated for long-term land and resource management purposes and constant service (FSM 7710.5).
Available Forest Land	Land that has not been legislatively or administratively withdrawn from timber production by the Secretary of Agriculture or Forest Service Chief.

B

Backlog	Any reforestation, site preparation, or watershed needs created prior to July 1, 1975.
Base Sale Schedule	A timber sale schedule formulated on the basis that the quantity of timber planned for sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade and this planned sale and harvest is not greater than the long-term sustained yield capacity (NFMA Planning Regulation).

GLOSSARY

Benchmark	Reference points that define the bounds within which feasible management alternatives can be developed. Benchmarks may be defined by resource output or economic measures.
Benefit (Value)	Inclusive terms to quantify the results of a proposed activity, project, or program expressed in monetary or nonmonetary terms.
Best Management Practices (BMP)	The set of practices in the Forest Plan which, when applied during implementation of a project, ensures that water related beneficial uses are protected and that State water quality standards are met. BMPs can take several forms. Some are defined by State regulation or memoranda of understanding between the Forest Service and the States. Others are defined by the Forest interdisciplinary planning team for application Forest-wide. Both of these kinds of BMPs are included in the Forest Plan as Forest-Wide Standards. A third kind are identified by the interdisciplinary team for application to specific management areas; these are included as Management Area Standards in the appropriate management areas. A fourth kind, project level BMPs, are based on site-specific evaluation and represent the most effective and practicable means of accomplishing the water quality and other goals of the specific area involved in the project. These project level BMPs can either supplement or replace the Forest Plan standards for specific projects.
Big Game	Those species of large mammals normally managed as a sport hunting resource.
Big Game Winter Range	The area available to and used by big game through the winter season.
Blackfeet Treaty Rights Area	Those lands on the Rocky Mountain Division where the Blackfeet Indian Nation retained certain use rights under the Treaty of 1896.
Board Foot (Bd. Ft. or BF)	A unit of timber measurement equaling the amount of wood contained in an unfinished board 1 inch thick, 12 inches long, and 12 inches wide.
Board Foot/Cubic Foot Conversion Ratio	Both board foot and cubic foot volumes can be determined for timber stands. The number of board feet per cubic foot of volume varies with tree species, diameter, and height, and form factors. For the Lewis and Clark, the Forest-wide average conversion ratio is 3.4 board feet per cubic foot.

GLOSSARY

Browse	Twigs, leaves, and young shoots of trees and shrubs which animals eat; in particular, those shrubs which big game animals eat.
C	
Capability	The potential of an area of land on water to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends upon current conditions and site conditions, such as climate, slope, landform, soils and geology, as well as the application of management practices, such as silviculture or protection from fires, insects, and disease (NFMA Planning Regulations).
Capable Lands	Those portions of the Forest that have an inherent ability to support trees for timber harvest and produce at least 20 cubic feet/acre/year of wood fiber.
Capital Investment	Investment in facilities such as roads and structures with specially-appropriated funds.
Carrying Capacity	The number or weight of organisms of a given species and quality that can survive in, without causing deterioration of, a given ecosystem through the least favorable environmental conditions that occur within a stated interval of time (Ford-Robertson, 1971).
Catchable Trout	A trout over 6 inches long.
CEQ	See Council on Environmental Quality.
CFR	Code of Federal Regulations.
Chargeable Volume	Chargeable volume is all volume that is included in the growth and yield projections for the selected management prescriptions used to arrive at the "allowable sale quantity," based on Regional utilization standards (FSM 2410.5).
Classes I, II, III -- Air Quality Standards	This is a designation given geographic areas of the country having air pollutant concentrations less than national standards. Denotes the increment above which deterioration of air quality would be regarded as significant and consequently not

allowed. Class I allows the least deterioration; class III, the most. See Clean Air Act (Public Law 88-206), section 163, for description of the specific increments.

Clearcutting — Harvesting of all trees in one cut. It prepares the area for a new, even-aged stand. The area harvested may be a patch, stand, or strip large enough to be mapped or recorded as separate age class in planning. Regeneration is obtained through natural seeding, or through planting or direct seeding.

Coefficients — The numeric units used to include costs, values, and outputs in the analysis model used in the formulation of the Forest Plan.

Collector Roads — Roads constructed to serve two or more resource elements, but which do not fit into the other two categories (arterial or local). Construction are prorated to the respective element served. These roads serve small land areas and are usually connected to a Forest arterial or public highway. They collect traffic from Forest local roads or terminal facilities. The location and standard are influenced by both long-term multi-resource service needs and travel efficiency. Forest collector roads are operated for constant or intermittent service, depending on land use and resource management objectives for the area served by the facility (FSM 7710.5).

Commercial Forest Land — Land that is producing, or is capable of producing, crops of industrial wood and (a) has not been withdrawn by Congress, the Secretary of Agriculture, or the Chief of the Forest Service; (b) where existing technology and knowledge is available to ensure timber production without irreversible damage to soils productivity or watershed conditions; and (c) where existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that adequate restocking can be obtained within years after final harvesting (FSM 2410.5).

Commodities — Resources with commercial value; all resource products which are articles of commerce, such as timber, range forage, and minerals.

Concern — See Management Concern.

GLOSSARY

Condition Class	A descriptive category of the existing tree vegetation as it relates to size, stocking, and age.
Constraint	A confinement or restriction on the range of permissible choices.
Consumptive Use	Uses of a resource that reduce the supply. Examples of some consumptive uses of water are irrigation, domestic and industrial water use, grazing, and timber harvest.
Continental Divide	The drainage divide between waters flowing to the Atlantic Ocean and the Pacific Ocean.
Corridor (Utility) Corridor)	A linear strip of land which has ecological, technical, economic, social, or similar advantages over other areas for the present or future location of transportation or utility routes.
Cost	The negative or adverse effects or expenditures resulting from an action. Costs may be monetary, social, physical, or environmental in nature.
Cost Efficiency	The usefulness of specified inputs (costs) to produce specified outputs (benefits). In measuring cost efficiency some outputs, including environmental, economic, or social impacts, are not assigned monetary values, but are achieved at specified levels in the least cost manner. Cost efficiency is usually measured using present net value, although use of benefit-cost ratios and rates-of-return may be appropriate (NFMA Planning Regulations).
Council on Environmental Quality	An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.
Cubic Feet	The amount of timber equivalent to a piece of wood 1 foot by 1 foot by 1 foot.
Culmination of Mean Annual Increment (CMAI)	The point at which the volume increment for a tree or stand of trees has achieved it's highest mean value. Mean annual increment is based on expected growth according to the management intensities and utilization standards assumed in the Forest Plan. The CMAI is calculated by dividing the attained growth (volume) by it's corresponding age.

GLOSSARY

Cultural Resources	The physical remains (artifacts, ruins, burial mounds, petroglyphs) and conceptual content or context (as a setting for legendary, historic, or prehistoric events, as a sacred area of native peoples) of an area of prehistoric or historic occupation.
D	
Data Base	A computerized data storage and retrieval system.
Demand	The amount of output that users are willing to take at a specific price, time period, and conditions of sale.
Departure	A schedule which deviates from the principle of nondeclining flow by exhibiting a planned decrease in the timber sale and harvest schedule at any time in the future.
Dependent Communities	Communities whose social, economic, or political life would become discernably different in important respects if market or non-market outputs from the National Forests were cut off.
Developed Recreation	Recreation that occurs where improvements enhance recreation opportunities and accommodate intensive recreation activities in a defined area.
Developed Recreation Site	Relatively small, distinctly defined area where facilities are provided for concentrated public use i.e. campgrounds, picnic areas, swimming areas, and ski areas.
Diameter Breast Height (d.b.h.)	The diameter of a tree measured four feet, six inches from the ground level. "Ground level" can follow two conventions; either the highest point of the ground touching the stem, or the mean of the highest and lowest points (Ford-Robertson, 1971).
Discount Rate	An interest rate that reflects the cost or time value of money. It is used in discounting future costs and benefits.
Dispersed Recreation	That portion of outdoor recreation use which occurs outside of developed sites in the unroaded and roaded forest environment i.e., hunting, backpacking, and berry picking.

GLOSSARY

District Ranger	The official responsible for administering the National Forest System Lands on a Ranger District.
Diversity	The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan (NFMA Planning Regulation).
Dry Forest	Commercial Forest land that usually receives less than 25 inches of precipitation per year. Includes the following habitat series: limber pine, ponderosa pine, Douglas fir/bluebunch wheatgrass, Douglas fir/white spirea, Douglas fir/nine bark, and subalpine fir/virgin's bower. The dry forest produces from 20 to 49 cubic feet/acre/year of wood fiber.
E	
Early Forest Succession	The biotic community that develops immediately following the removal or destruction of the vegetation in an area.
Effective Buying Income	That portion of income left after taxes, housing, food, and clothing have been paid for.
Effects	Physical, biological, social, and economic results (expected or experienced) resulting from achievement of outputs. Effects can be direct, indirect, and cumulative.
Efficiency, Economic	The usefulness of inputs (costs) to produce outputs (benefits) and effects when all costs and benefits that can be identified and valued are included in the computations. Economic efficiency is usually measured using present net value, though use of benefit-cost ratios and rates-of-return may sometimes be appropriate.
Endangered Species	Any species, plant or animal, which is in danger of extinction throughout all or a significant portion of its' range. Endangered species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act.
Ending Inventory Constraint	Constraint to ensure that the total timber volume left at the end of the planning horizon will equal or exceed the volume that would occur in a regulated, managed forest.

GLOSSARY

Environmental Analysis	A process involving analysis of alternative actions and their predictable short- and long-term environmental effects, which include physical, biological, economic, social, and environmental design factors and their interactions.
Environmental Assessment (EA)	Means a concise public document for which a Federal agency is responsible that serves to: (1) Briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact. (2) Aid an agency's compliance with the Act when no environmental impact statement is necessary. (3) Facilitate preparation of a statement when one is necessary. Shall include brief discussions of the need for the proposal, of alternatives as required by sec. 102(2)(E), of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted (40 CFR 1508.9).
Even-Aged Management	The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together. Managed even-aged forests are characterized by a distribution of stands of varying ages (and, therefore, tree sizes) throughout the forest area. The difference in age between trees forming the main canopy level of stand usually does not exceed 20 percent of the age of the stand at harvest rotation age. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desire age or size for regeneration and is harvested. Cutting methods including clearcutting, shelterwood cutting, and seed tree cutting.
Extensive Timber Management	The practice of forestry on a basis of low operating and investment costs per acre.

F

Fee Site	A Forest Service recreation area in which users must pay a fee. Fee sites must meet certain standards and provide certain facilities as specified in the Forest Service Manual.
Final Cut	See Overwood Removal.

GLOSSARY

Forage	Forage refers specifically to all browse and non-woody plants that are available to livestock or game animals and used for grazing or harvesting for feeding.
Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA)	An act of Congress which requires the assessment of the Nation's renewable resources and the periodic development of a national renewable resources program. It also requires the development, maintenance and, as appropriate, revision of land and resource management plans for units of the National Forest System (e.g. National Forest).
Forest Supervisor	The official responsible for administering the National Forest System lands in a Forest Service Administrative unit, which may consist of two or more National Forests or all the Forests within a state.
Forest System Roads	A road wholly or partly within or adjacent to and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and developments of it's resources.
FORPLAN	A computer system used as a resource allocation model for developing and analyzing Forest planning alternatives.
Forest Wide Management Standard	An indication or outline of policy or conduct dealing with the basic management of the Forest. Forest-wide management standards apply to all areas of the Forest, regardless of the other management prescriptions applied.
Fuel Management	The practice of planning and executing treatment or control of any vegetative material which adversely affects meeting fire management direction based upon resource management goals and objectives.
Fuels	Wildland vegetative materials which can burn. While usually referring to above ground, living and dead wildland surface vegetation, roots and organic soils such as peat are often included (FSM 5150).

GLOSSARY

G

Game Species

Any species of wildlife or fish for which seasons and bag limits have been prescribed. These species are normally harvested by hunters, trappers, and fishermen, under State or Federal laws, codes, and regulations.

General Forest (GF)

Commercial forest land that usually receives more than 25 inches of precipitation per year. Includes the following habitat types: Douglas fir/pinegrass, subalpine fir/twinflower, subalpine fir/blue huckleberry, subalpine fir/grouse whortleberry, subalpine fir/sweetscented bedstraw, subalpine fir/menziesia, and subalpine fir/pinegrass. The general forest is further subdivided into (1) high productivity (from 50 to 84 cubic feet/acre/year of wood fiber) and (2) low productivity (from 20 to 49 cubic feet/acre/year of wood fiber).

Goals

A concise statement that describes a desired future condition. It is normally expressed in broad, general terms and is timeless in that it has no specific date by which it is to be completed. Goal statements form the principal basis from which objectives are developed.

Goods and Services

The various outputs, including onsite uses, produced by forest and rangeland renewable resources.

Gravity Surveys

Gravity surveys generally involve vehicle supported operations in which gravity-density variations are measured by surface instruments. These surveys are usually limited to roads and gentle terrain.

Group Selection

A modification of the selection harvest system in which trees are removed in small groups at a time (Ford-Robertson, 1971).

H

Habitat Type

An aggregation of all land areas potentially capable of producing similar plant communities at climax.

GLOSSARY

Hiding Cover	Vegetation capable of essentially hiding an adult elk from view at a distance equal to or less than 200 feet.
Horizontal Demand	The assumption that, under pure competition, the Forest can sell as much timber as it wishes without affecting market price.
Hunter Day	Any part of a day spent hunting.
I	
Indicator Species	A species selected because its population changes indicate effects of management activities on the plant and animal community. A species whose condition can be used to assess the impacts of management actions on a particular area.
Indirect Effects	Secondary effects which occur in locations other than the initial action or significantly later in time.
Integrated Pest Management	A process for selecting strategies to regulate forest pests in which all aspects of a pest-host system are studied. The information considered in selecting appropriate strategies includes (1) the impact of the unregulated pest population on various resources values, (2) alternative regulatory tactics and strategies, and (3) benefit/cost estimates for these alternative strategies. Regulatory strategies are based on sound silvicultural practices and ecology of the pest-host system and consist of a combination of tactics, such as timber stand improvement plus selective use of pesticides. A basic principle in the choice of strategy is that it be ecologically compatible or acceptable (NFMA Planning Regulations).
Intensive Grazing	Grazing management that controls distribution of cattle and duration of use on the range, usually by fences, so parts of the range are not grazed during the growing season.
Intensive Timber Management	The practice of forestry so as to obtain a high level of volume and quality of output per unit of land, through applying the best techniques of silviculture and management.

GLOSSARY

Intermittent Streams	A stream which flows only when it receives water from springs or from some surface source, such as melting snow in mountainous areas.
Interpretive Services	Visitor information services designed to present inspirational, educational, and recreational values to Forest visitors to provide the utmost in understanding, appreciation, and enjoyment from their Forest experience.
Inventory Data	Recorded measurements, facts, evidence, or observations on Forest resources such as soil, water, timber, wildlife, range, geology, minerals, and recreation which was used to determine the capability and opportunity of the Forest to be managed for those resources.
Issue	See Public Issue.
L	
Land Base	Net Forest acres.
Land Exchange	The conveyance of non-Federal land or interests to the United States in exchange for National Forest System land or interests in land.
Land Line Location	Legal identification and accurate location of National Forest property boundaries.
Land Type	An area of land classified on the basis of geomorphic principles. Geologic processes (as reflected in land surface form and features), individual kinds of soil, and the factors which determine the behavior of ecosystems (i.e. climate, vegetation, relief, parent materials, and time) are used as the basis of this classification system.
Late Forest Succession	A stage of forest succession where the majority of trees are mature or overmature.
Leasable Minerals	See Minerals, Leasable.
Level I Fire Analysis	General fire management analysis to provide historical information that assists the interdisciplinary team in the analysis of the management situation and formulation of alternatives for the Forest Plan.

Level II Fire Analysis	An analytical process which guides the implementation of fire management activities of the Forest Plan.
Linear Programming	A mathematical method used to determine the most effective allocation of limited resources between competing demands, when both the objective (e.g. profit or cost) and the restrictions on its attainment are expressible as a system of linear equalities or inequalities (e.g., y=a+bx).
Limited Surface Use	A mineral lease clause, which, if attached to a mineral lease, prohibits surface disturbing activities on the lease pending submission of a surface use and operations plan which is satisfactory to the BLM and the surface management agency for protection of special existing or planned uses. This stipulation may, when site-specific operations are proposed and analyzed, be modified if other less stringent mitigation is determined to be sufficient to protect the other resources.
Livestock Use	Animals that graze Forest Service lands under a grazing permit or in conjunction with recreation such as horses and mules.
Local Dependent Industries	Industries relying on National Forest outputs for economic activity.
Local Roads	Roads constructed and maintained for, and frequented by, the activities of a given resource element. Some use may be made by other element activities, but normally maintenance is not affected by such use. These roads connect terminal facilities with Forest collector or Forest arterial roads or public highways. The location and standard usually are determined by the requirement of a specific resource activity rather than by travel efficiency. Local roads may be developed and operated for constant or intermittent service depending on land use and resource management objectives for the area served by the facility.
Locatable Minerals	See Minerals, Locatable.
Long-Term Sustained Yield Capacity (LTSYC)	The highest uniform wood yield from lands being managed for timber production that may be sustained under a specified intensity of management consistent with multiple use objectives (NFMA Planning Regulations).

GLOSSARY

M	
Management Action	Any activity undertaken as part of the administration of the Forest.
Management Area	An aggregation of capability areas having common management direction. These areas may be non-contiguous and are used to allocate and schedule management practices.
Management Concern	An issue, problem, or condition which constrains the range of management practices identified by the Forest Service in the planning process.
Management Direction	A statement of multiple use and other goals and objectives, the management prescriptions, and the associated standards and guidelines for attaining them.
Management Intensity	A management practice or combination of management practices and associated costs designed to obtain different levels of goods and services.
Management Opportunity	A statement of general actions, measures, or treatments that favorably addresses a public issue or management concern.
Management Practice	A specific activity, measure, course of action, or treatment. Proposed management practices are those scheduled in the first decade of Forest Plan implementation. Probable management practices are those scheduled in the second decade of Forest Plan implementation.
Management Prescription	Management practices and intensity selected and scheduled for application in a specific area to attain multiple use and other goals and objectives.
Management Standards and Guidelines	See Standard.
Market Value	The unit price of an output normally exchanged in a market after at least one stage of production, expressed in terms of what people are willing to pay as evidenced by market transactions.
Maximum Resource Potential	The maximum possible output of a given resource limited only by its inherent physical and biological characteristics.

Mean Annual Increment	The total volume up to a given age divided by that age, i.e., total volume divided by corresponding age. Culmination of mean annual increment occurs when the greatest mean annual increment is reached.
Mineral Development	The preparation of a proven deposit for mining.
Mineral Entry	The filing of a mining claim for public land to obtain the right to any minerals it may contain (Thrush, 1968).
Mineral Entry Withdrawal	The exclusion of the right of possession of locatable mineral deposits by the locator on areas required for administrative sites by the Forest Service and other areas highly valued by the public. Public lands are generally withdrawn from entry under the General Mining Laws and/or the mineral leasing laws.
Mineral Exploration	The search for valuable minerals on lands open to mineral entry.
Mineral Production	Extraction of mineral deposits.
Minerals, Leasable	Types of minerals whose prospecting and development on public lands under permit or lease was authorized by the Mineral Leasing Act of February 25, 1920, as amended and supplemented (41 Stat. 437, 30 USC 181-287). For example, coal, phosphate, sodium, potassium, oil, oil shale, gas, and in some states, sulphur (FSM 2800).
Minerals, Locatable	Those hardrock minerals which are mined and processed for the recovery of the minerals; often metallic. May include certain nonmetallic minerals and uncommon varieties of mineral materials, such as valuable and distinctive deposits of limestone and silica. May include any solid, natural inorganic substance occurring in the crust of the earth, except for the common varieties of mineral materials and leasable minerals.
Mining Claims	That portion of the public estate held for mining purposes in which the right of exclusive possession of locatable mineral deposits is vested in the locator of a deposit.
Mitigate	To lessen the severity.

GLOSSARY

Monitoring and Evaluation	The periodic evaluation, on a sample basis, of Forest Plan management practices, to determine how well objectives have been met and how closely management standards have been applied.
Montana Wilderness Study Act Areas (MWSA)	Those areas (Middle Fork Judith and Big Snowies) that are required to be studied for their wilderness suitability under the Montana Wilderness Study Act of 1978 (Public Law 95-1950).
Multiple Use	The management of all the various renewable surface resources of the National Forests in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources, or related services, over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some lands will be used for less than all resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration given to the relative values of the various resources, and not necessarily the combination of the uses that will give the greatest dollar return, or the greatest unit output (NFMA Planning Regulations).
N	
National Environmental Policy Act (NEPA)	An act to declare a National policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality.
National Forest Landscape Management System	A system of planning and administering the use of forest lands so that the visual effects maintain or upgrade man's psychological welfare. It is the planning and design of the visual aspects of multiple use land management.

GLOSSARY

National Forest Management Act (NFMA)	A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resource Planning Act (RPA) that requires the preparation of Regional and Forest plans and the preparation of regulations to guide that development.
National Forest System Land	National Forests, National Grasslands, and other related lands for which the Forest Service is assigned administrative responsibility.
National Recreation Trails	Trails designated, by the Secretary of the Interior or the Secretary of Agriculture, as part of the national system of trails authorized by the National Trails System Act. National recreation trails provide a variety of outdoor recreation uses.
National Wilderness Preservation System	All lands covered by the Wilderness Act and subsequent wilderness designations, irrespective of the department or agency having jurisdiction.
Natural Fuels	Fuels not directly generated or altered by management activity. This includes fuels which have accumulated as a result of fire exclusion (FSM 5130).
NEPA	See National Environmental Policy Act.
Net Public Benefits	An expression used to signify the overall long-term value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs). whether or not they can be quantitatively valued. Net public benefits are measured by both quantitative and qualitative criteria, rather than a single measure or index. The maximization of net public benefits to be derived from management of units of the National Forest System is consistent with the principles of multiple use and sustained yield.
NFMA	See National Forest Management Act.
No Action Alternative	The management direction, activities, outputs, and effects most likely to exist in the future if the current plan would continue unchanged.
Noncommodity Outputs	A resource output that cannot be bought and sold.
Nonconsumptive Use	Those uses of resources that do not reduce the supply. For example: Nonconsumptive uses of water include hydroelectric power generation, boating, swimming, etc.

GLOSSARY

Nondeclining Yield (NDY)	A level of timber production planned so that the planned sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade.
Nongame	Species of animals which are not managed as a sport hunting resource.
No-Surface Occupancy Stipulation	A mineral lease clause that permits passive activities, such as seismic exploration or directional drilling from adjacent areas, but prohibits the occupancy of the surface with roads or drilling equipment.
O	
Objective	A concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals.
Off-Road Vehicle (ORV)	Any vehicle capable of being operated off an established road or trail.
Old-Growth	A stand of trees that is past full maturity and showing decadence; the last stage in forest succession.
Operations Plan	A written plan, approved by a Forest Officer, prepared by those engaged in mining activity on the Forest prospecting, exploration, describing mining and mineral processing activities that will likely cause a significant disturbance of surface requirements.
Opportunity Cost	An opportunity cost is value foregone. In this analysis it is a cost calculated as the difference between present net value of the alternative and the present net value of the maximum PNV increment.
Outputs	A good, service, or on-site use that is produced from Forest and rangeland resources. Definitions of Forest and rangeland output definitions, codes, and units measure are contained in the Management

	Information Handbook (FSH 1309.11). Examples are: X06-Softwood Sawtimber Production - MBF; X80-Increased Water Yield - Acre Feet; W01-Primitive Recreation Use - RVDs.
Overmature Timber	Trees that have attained full development, particularly in height, and are declining in vigor, health, and soundness.
Overstory	That portion of the forest forming the upper or uppermost canopy.
Overwood Removal	Removal of the last seed bearers or shelter trees after regeneration is considered to be established under a shelterwood system. This removal is also termed a final cut.
Overthurst Belt	A complex geologic feature, extending from Alaska to Mexico, which resulted from compressional stresses within the earth, and which is characterized by abundant thrust faults. This zone passes through and includes all of western Montana.
P	
Particulates	Small particles suspended in the air and generally considered pollutants.
Patented Mining Claims	A patent is a document which conveys title to land. When patented, a mining claim becomes private property and is land over which the United States has no property rights, except as may be reserved in the patent. After a mining claim is patented, the owner does not have to comply with requirements of the General Mining Law or implementing regulations.
Perennial Streams	Streams that flow continuously throughout most years.
Permit Grazing	Use of a National Forest range allotment under the terms of a grazing permit.
Planned Ignitions	A fire started by a deliberate management action.
Planning Area	The area of the National Forest System covered by a Regional or Forest Plan.

GLOSSARY

Planning Criteria	Standards, tests, rules, and guidelines by which the planning process is conducted and upon which judgments and decisions are based.
Planning Horizon	The overall time period considered in the planning process that spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions which would influence the planning decisions (NFMA Planning Regulations).
Planning Period	A time interval for which inputs and outputs are identified in a planning process. Current RPA and National Forest Plan intervals are 5 and 10 years, respectively.
Planning Records	The documents that record decisions and activities that result from developing a Forest Plan and its revisions.
Pole	Trees from 5.0 to 6.9 inch d.b.h.
Policy	A guiding principle upon which is based a specific decision or set of decisions.
Practice	See Management Practice.
Precommercial Thinning	The selective felling, deadening, or removal of trees in a young stand, primarily to accelerate diameter, on the remaining stems, maintain a specific stocking or stand density range, and improve the vigor and quality of the trees that remain. This practice is also important for lowering stand susceptibility to mountain pine beetle.
Preparatory Cut	Removal of trees near the end of a rotation so as to permanently open the canopy and enlarge the crowns of seed bearers. This improves conditions for seed production and natural regeneration, and is typical in shelterwood systems.
Present Net Value (PNV)	The difference between the discounted value (benefits) of all outputs, to which monetary values or established market prices are assigned, and the total discounted costs of managing the planning area.
Present Net Worth	The discounted value of price times quantity less cost.

Prescribed Fire	A wildland fire burning under specified conditions which will accomplish certain planned objectives. The fire may result from either planned or unplanned ignitions (FSM 5105).
Prescription	See Management Prescription.
Presuppression	Activities required in advance of fire occurrence to ensure effective suppression action. Includes 1) recruiting and training fire forces; 2) planning and organizing attack methods; 3) procuring and maintaining fire equipment; and 4) maintaining structural improvements necessary for the fire program.
Primitive Recreation Setting	A classification of the recreation opportunity spectrum that is characterized by essentially unmodified natural environment of at least 5,000 acres. Interaction between users is very low and evidence of other area users is minimal. The area is managed to be essentially free from evidence of man-induced restrictions and controls. Motorized use within the area is not permitted.
Production Potential	The capability of the land or water to produce life-sustaining features (forage, cover, aquatics).
Productivity	See Site Productivity.
Program Planning and Budgeting	The process by which activities for the Forest are proposed and funded.
Proposed Action	In terms of the National Environmental Policy Act, the project, activity, or action that a Federal agency intends to implement or undertake and is the subject of an environmental analysis.
Public Access	Usually refers to a road or trail route over which a public agency claims a right-of-way available for public use.
Public Issue	A subject or question of widespread public interest relating to management of National Forest System lands (NFMA Planning Regulations).

R

Range Allotment	A designated area of land available for livestock grazing upon which a specified number and kind of

livestock may be grazed under a range allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System and associated lands administered by the Forest Service.

Range Condition — The state of health of the range based on what it is naturally capable of producing (Kothmann, 1974).

Ranger District — Administrative subdivisions of the Forest supervised by a District Ranger who reports to the Forest Supervisor.

RARE II — See Roadless Area Review and Evaluation II.

Research Natural Area — An area in as near condition as possible, which exemplifies typical or unique vegetation and associated biotic, soil, geologic, and acquatic features. The area is set aside to preserve a representative sample of an ecological community, primarily for scientific and educational purposes; commercial and general public use is not allowed.

Record of Decision — A document, separate from but associated with an environmental impact statement, that publicly and officially discloses the responsible official's decision on the proposed action.

Recreation Capacity — The number of people that can take advantage of the supply of recreation opportunity without substantially diminishing the quality of the experience sought after.

Recreation Residence — Houses or cabins on National Forest land that are not the primary residence of the owner.

Recreation Opportunities — The combination of recreation settings, activities, and experience provided by the Forest.

Recreation Opportunity Spectrum (ROS) — A system for planning and managing recreation resources that recognizes recreation activity opportunity, recreation setting opportunity, and recreation experience opportunity along a spectrum or continuum.

Recreation Settings — See Primitive, Semi-Primitive, Roaded Natural, and Rural for definitions of the different types of recreation settings.

Recreation Visitor Day (RVD) — One visitor day equals 12 hours (one person for 12 hours, or 12 people for 1 hour, or any combination thereof).

GLOSSARY

Red Belt	The name "red belt" is applied to winter drying that occurs in zones, or belts, more or less following contour lines. Red belt occurs during midwinter or early spring, often a period of cold weather. Sudden large increases in temperature, often accompanied by drying winds (chinooks), cause excessive loss of water from the needles. This moisture loss cannot be replaced because the soil moisture is either frozen or too cold, is not available from the roots, or because the wood in the stem is frozen and water cannot pass through it. The disease manifests itself by browning of the needles in the spring.
Reforestation	The re-establishment of a tree crop on forest land.
Regeneration	The renewal of a tree crop, whether by natural or artificial means.
Regeneration Cut	Any removal of trees intended to assist regeneration already present or to make regeneration possible.
Regional Forester	The official responsible for administering a single Region.
Regional Guide	A document developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, that guides all natural resource management activities and establishes management standards and guidelines for the National Forest System lands of a given Region. It also disaggregates the RPA objectives assigned to the Region to the Forests within that Region.
Regulated	The commercial forest land that is organized for timber production under the principle of sustained yield. The harvest of timber from this land will be regulated to achieve several long range objectives, such as maintaining setting for recreational activities, rotating forage production areas and wildlife habitat, increasing water yield, and increasing the growth and use of timber for the Nation's supply.
Regulations	36 CFR refers to the Code of Federal Regulations for implementing the National Forest Management Act.

GLOSSARY

Resource Allocation Model	A mathematic model using linear programming which will assign prescriptions and schedule implementation of those prescriptions simultaneously. The end purpose of the model is to find a schedule and prescription assignment that meets the goals of the Forest and optimizes some objective function, such as maximization of present net value.
Right-of-Way	Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project facility passing over, upon, under, or through such land.
Riparian Zones	Geographically delineated areas, with distinctive resource values and characteristics, that are comprised of the aquatic and riparian ecosystems, floodplains, and wetlands. They include all areas within a horizontal distance of 100 feet from the edge of perennial streams or other water bodies.
Roadless Area	A National Forest area which (1) is larger than 5000 acres or, if smaller than 5000 acres, contiguous to a designated wilderness or primitive area; (2) contains no roads, and (3) has been inventoried by the Forest Service for possible inclusion in the wilderness preservation system.
Roadless Area Review and Evaluation (RARE) II	A comprehensive process, instituted in June 1977, to identify roadless and undeveloped land areas in the National Forest System and to develop alternatives for both wilderness and other resource management.
Road Management	The combination of both traffic and maintenance management operations. Traffic management is the continuous process of analyzing, controlling, and regulating uses to accomplish National Forest objectives. Maintenance management is the perpetuation of the transportation facility to serve intended management objectives.
Roaded Natural Recreation Setting	A classification of the recreation opportunity spectrum where the area is characterized by predominantly natural appearing environments with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment. Interaction between users may be low to moderate, but with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.

Rotation	The planned number of years between the formation or regeneration of a crop or stand and its final cutting at a specified stage of maturity.
RPA	See Forest and Rangeland Renewable Resources Planning Act.
RPA Program	The program for management and administration of the National Forest Service System, for research, for cooperative State and private Forest Service programs, and for conduct of other Forest Service activities in accordance with Section 4 of the Forest and Rangeland Renewable Resources Planning Act.
Rural Recreation Setting	A classification of recreation opportunity spectrum that is characterized by substantially modified natural environment. Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high.
S	
Salvage Cutting	The exploitation of trees that are dead, dying, or deteriorating (e.g. because overmature or materially damaged by fire, wind, insects, fungi, or other injurious agencies) before their timber becomes worthless.
Sanitation Cutting	The removal of dead, damaged, or susceptible trees, essentially to prevent the spread of pests or pathogens and so promote forest hygiene.
Sawtimber	Trees suitable in size and quality that can be processed into lumber. For planning purposes on the Forest, lodgepole pine with a 6-inch d.b.h. and other species with a 7-inch d.b.h. were classified as sawtimber.
Scoping Process	An early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to the proposed action. Identifying the significant environmental issues deserving of study and de-emphasizing insignificant issues, narrowing the scope of the environmental impact statement accordingly. (Ref. CEQ regulations, 40 CFR 1501.7).

GLOSSARY

Sediment	Solid material, both mineral and organic, that is in suspension, being transported, or has been moved from its site of origin by air, water, gravity, or ice.
Seed Tree Cutting	Removal of trees in a mature stand so as to affect permanent opening of its canopy (if there is no preparatory cutting to do this) and so provide conditions for securing regeneration from the seed of trees retained for that purpose; the first of the shelterwood cuttings under a shelterwood system.
Seedling/Sapling	A forest successional stage in which trees less than 5 inches in diameter are the predominant vegetation. Seedlings are 0-0.9 inch d.b.h., saplings are 1-4.9 inch d.b.h.
Seismic Exploration	Seismic exploration is used to map underground geological features, to obtain more reliable information on the earth's subsurface, and to locate areas where accumulations of oil and gas might occur. Seismic waves, generated at or near the surface, penetrate the earth's crust and reflect from subsurface rock layers back to the surface. The geophysicist receives a printed record, or seismograph, from which is measured the depth to various strata and from which subsurface structures with a potential for oil and gas accumulation such as faults, anticlines, and folds can be determined.
Portable	Where access limitations, topography, or other restraints prevent use of trucks, portable operations can be performed. Two portable techniques exist for collecting data. (1) Surface charge programs involve the detonation of a series of as much as 50 to 100 pounds of explosives at shot points at intervals along the seismic line. Surface charges can be placed directly on the ground, on snow, or on a variety of stakes or platforms. All necessary equipment to conduct the operation is transported by helicopters and then conveyed by foot travel. (2) Various kinds of portable drills can be backpacked or delivered by helicopter to the area. A shallow subsurface portable program would involve drilling a pattern of approximately 16

holes about 4 inches in diameter up to 50 feet deep per mile of line. At this depth, a 10 to 40 pound charge of explosive is placed and detonated. Recording cables and geophones are laid out by foot travel.

With both of these portable techniques, shock waves generated by detonation are received and transmitted via geophones and cable to a recording device. Portable methods are generally used on the Forest.

Conventional

The conventional method of collecting seismic data includes the use of truck mounted drills and vehicle-supported crews which generally involves off-road vehicle travel. This technique involves drilling 5 to 18 (generally 6) 5-inch diameter holes per mile to a depth of 180 to 200 feet. At this depth a 10 to 100 (generally 25 to 50) pound charge of explosive is placed and detonated. Shock waves are received and transmitted via geophones and cable to a truck-mounted recording device. Due to terrain restrictions, this method has limited application on the Forest.

Vibroseis

The vibroseis technique involves using truck-mounted hydraulic pads which generate energy waves through vibration rather than explosives. The vibrator method typically consists of four large trucks each equipped with a vibrator (a steel slab weighing about three tons) mounted between the front and back wheels. The vibrator pads (about four feet square) are lowered to the ground and vibrators on all trucks are triggered electronically from the recorder truck. Energy waves are received and transmitted via cable and geophones to a recorder truck. After the information is recorded, the trucks move forward a short distance and the process is repeated. The vibroseis operation is usually limited to roads and gentle terrain.

Selection Cutting

The annual or periodic removal of trees (particularly the mature), individually or in small groups, from an uneven-aged forest to realize the yield and establish a new crop of irregular structure.

Semi-Primitive Recreation Setting

A classification of recreation opportunity spectrum that characterizes a predominantly natural or natural appearing environment of a moderate to large size. Concentration of users is low, but there is often evidence of other area users. The

area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Motorized use may or may not be present, depending on the travel plan for the area.

Shelterwood — Even-aged silvicultural systems in which, in order to provide a source of seed and/or protection for regeneration, the old crop (the shelterwood) is removed in two or more successive shelterwood cuttings, the first of which is ordinarily the seed cutting (though it may be preceded by a preparatory cutting) and the last is the final cutting. Any intervening cuttings is called removal cuttings. NOTE: Removing the old crop in two successive cuttings, generally a regeneration cut and an overwood removal, is termed a two-step shelterwood. Removing the crop in three successive cuts, generally a preparatory cut, regeneration cut, and an overwood removal, is termed a three-step shelterwood.

Silvicultural Systems — A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the fellings that remove the mature crop and provide for regeneration and according to the type of forest thereby produced (NFMA Planning Regulations).

Site Preparation — A general term for removing unwanted vegetation, slash, and even roots and stones from a site before reforestation.

Site Productivity — Production capability of specific areas of land.

Slash — The residue left on the ground after felling and other silvicultural operations and/or accumulating there as a result of storm, fire, girdling, or poisoning.

Small Game — Birds and small mammals normally hunted or trapped.

Snag — Standing dead tree larger than 6 inches d.b.h. and greater than 20 feet in height.

Social Variable — A variable that measures the social impact of Forest Service management alternatives. Examples include population statistics, types of institutions, and personal opinion as reflected in attitudes or as demonstrated by behavior.

GLOSSARY

Soil Productivity	The capacity of a soil to produce a specific crop, such as fiber and forage, under defined levels of management. It is generally dependent on available soil moisture and nutrients and length of growing season.
Spacial Fitting	The mapping of alternatives to make sure adjacent management emphases are compatible.
Special Use Permit	A permit issued under established laws and regulations to an individual, organiztion, or company for occupancy or use of National Forest land for some special purpose.
Stagnation	A condition where plant growth is markedly reduced or even arrested through competition, state of the soil, or disease.
Standard	Standards specify the desired result in specific enough terms to provide meaningful direction and to permit compliance to be measured or verified. Standards can, however, be phrased to require different levels of compliance. In some cases there will be a need to establish absolute limits. In other cases some discretion may be permitted; in these cases the standard can be written to build in the permissable discretion.
Stipulations	The requirements or clauses of a mineral lease.
Subdivisions	Areas of previously undeveloped land divided into individual homesites and/or blocks of lots with streets or roads and open spaces.
Successional Stage	A phase in the gradual supplanting of one community of plants by another.
Suitability	The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.
Suitable Forest Land	Forest land (as defined in CFR 219.3) for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions; for which there is reasonable assurance that such lands

can be adequately restocked (as provided in CFR 219.14); and for which there is management direction that indicates that timber production is an appropriate use of that area.

Suppression — All the work of extinguishing or confining a fire, beginning with its discovery.

T

Targets — A quantifiable output.

Thinning — A felling made in an immature crop or stand primarily to accelerate diameter growth but also, by suitable selection, to improve the average form of the trees that remain, without permanently breaking the canopy.

Threatened Species — Any species, plant or animal, which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its' range. Threatened species are identified by the Secretary of the Interior in accordance with the 1973 Endangered Species Act.

Tiering — Refers to the elimination of repetitive discussions of the same issue by incorporating by reference the general discussion in an environmental impact statement of broader scope. For example, a project environmental assessment could be tiered to the Forest Plan EIS.

Timber — A general term for the major woody growth of vegetation in a forest area.

Timber Base — The lands within the Forest that are suitable for timber production.

Timber Sale Program — The volume of timber planned for sale during the first decade of the planning horizon. It includes the allowable sale quantity (chargeable volume) and any additional material (nonchargeable volume) planned for sale. The timber sale program quantity is usually expressed as an annual average for the first decade (FSM 2410.5).

Timber Production	The growing, tending, harvesting, and regeneration of regulated crops of industrial wood. Industrial wood includes logs, bolts, or other round sections cut from trees for industrial or consumer use, except fuelwood.
Timber Stand Improvements	A loose term comprising all intermediate cuttings made to improve the composition, structure condition, and quality of a timber stand.
Trailheads	The parking, signing, and other facilities available at the terminus of a trail.
Transitory Range	Land that is suitable for grazing use of a nonenduring or temporary nature over a period of time. For example, on particular disturbed lands, grass may cover the area for a period of time before being replaced by trees or shrubs not suitable for forage.
Tree Opening	An opening in the forest cover created by even-aged silvicultural practices.
Trespass	The act of going on another's land or property unlawfully.
U	
Understory	The trees and other woody plants growing under a more or less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth.
Uneven-aged Management	The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single tree selection and group selection (NFMA Planning Regulations).
Unplanned Ignition	A fire started at random by either natural or human causes, or a deliberate incendiary (FSM 5105).

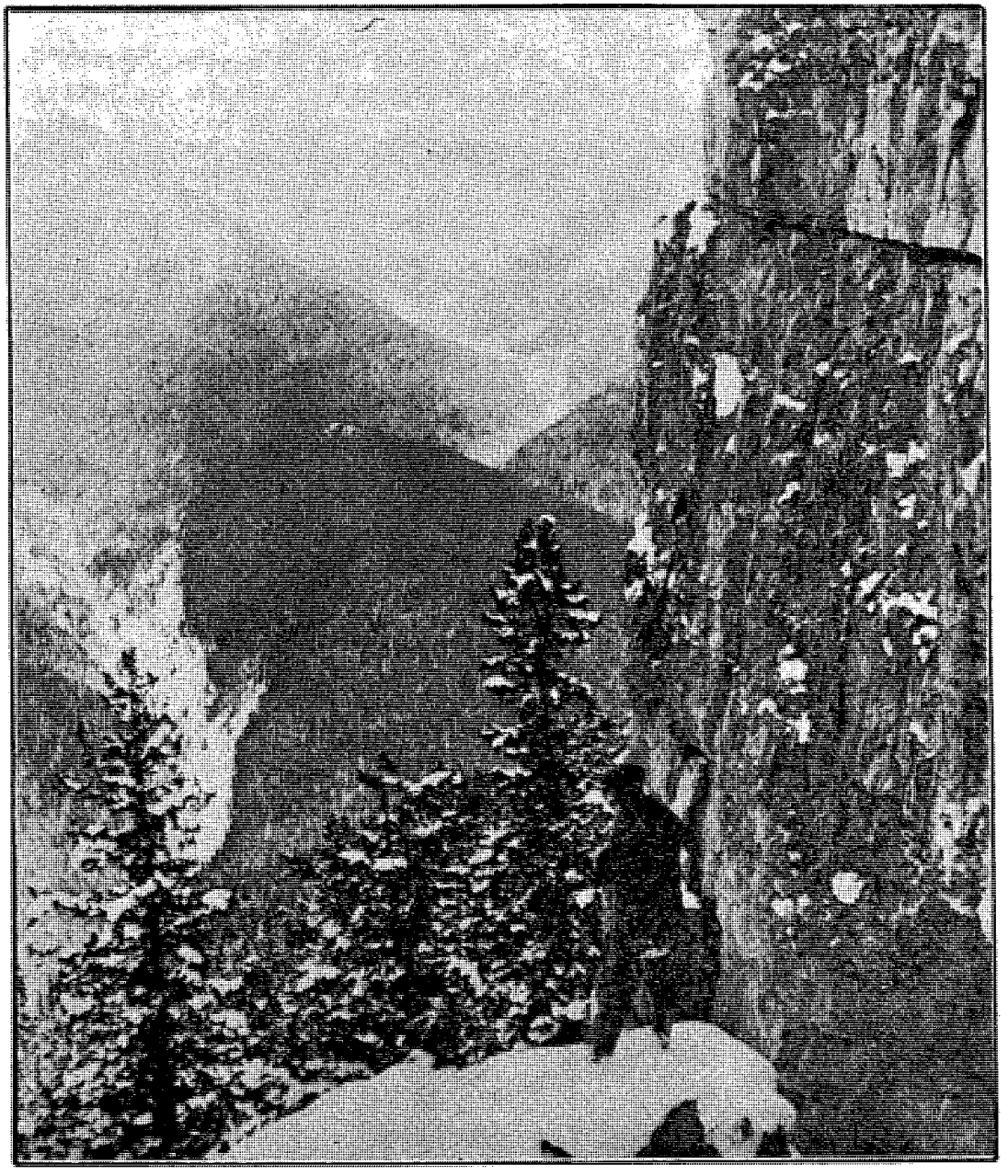
GLOSSARY

Unregulated Harvest	This harvest is not charged against the allowable sale quantity. It includes occasional volumes removed that were not recognized in calculations of the allowable sale quantity, such as cull or dead material and noncommercial species and products. It also includes all volume removed from unsuitable areas. Harvests from unsuitable areas will be programmed as needed to meet multiple-use objectives other than timber production and for improvement of administrative sites.
Unsuitable Forest Land (Not Suited)	Forest land that is not managed for timber production because (a) the land has been withdrawn by Congress, the Secretary, or the Chief; (b) the land is not producing or capable of producing crops of industrial wood; (c) technology is not available to prevent irreversible damage to soils, productivity, or watershed conditions; (d) there is no reasonable assurance that lands can be adequately restocked within 5 years after final harvest, based on existing technology and knowledge, as reflected in current research and experience; (e) there is at present, a lack of adequate information to responses to timber management activities; or (f) timber management is inconsistent with or not cost efficient in meeting the management requirements and multiple-use objectives specified in the Forest Plan (FSM 2410.5).
Utilization Standards	Standards guiding the use and removal of timber. They are measured in terms of minimum diameters, minimum lengths, and percent "soundness" of the wood.
V	
Value, Market	The unit price of an output normally exchanged in a market after at least one stage of production, expressed in terms of what people are willing to pay as evidenced by market transactions.
Value, Nonmarket	The unit price of an output not normally exchanged in a market after at least one stage before consumption, and thus must be imputed from other economic information.
Vegetation Treatment	Any activities undertaken to modify the existing condition of the vegetation.
Viable Populations	A wildlife or fish population of sufficient size to maintain its existence over time, in spite of normal fluctuations in population levels.

GLOSSARY

Visual Quality Objective (VQO)	A desired degree of acceptable alteration of the landscape based on physical and sociological characteristics of an area. For this plan, these degrees of alteration are classified by preservation, retention, partial retention, and modification.
Preservation	Management activities, except for very low visual-impact recreation facilities, are prohibited. Only ecological changes are allowed.
Retention	Activities must not be visually evident and may only repeat form, line, color, and texture which are frequently found in the characteristic landscape. Changes in the qualities of size, amount, intensity, direction, and land pattern should not be evident. Duration of Visual Impact: Immediate reduction in form, line, color, and texture contrast. Retention should be accomplished either during operation or immediately after. It may be done by such means as seeding vegetative clearings and cut-or-fill slopes, hand planting of large stock, and painting structures.
Partial Retention	Activities remain visually subordinate to the characteristic landscape and may repeat form, line, color, or texture common to the landscape. However, changes in the qualities of size, amount, intensity, direction, and pattern remain visually subordinate to the characteristic landscape. Duration of Visual Impact: Reduction in form, line, color, and texture should be accomplished as soon after project completion as possible or at a minimum within the first year.
Modification	Activities may visually dominate the original characteristic landscape. However, activities of vegetative and land form alteration must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Additional parts of these activities, such as structures, roads, slash, and root wads, must remain visually subordinate until they are compatible with the natural surroundings.

	Duration of Visual Impact: Reduction in form, line, color, and texture should be accomplished in the first year or at a minimum should meet existing regional guidelines.
Visual Resource	The composite of basic terrain, geologic features, water features, vegetative patterns, and land uses that typify a land unit and influence the visual appeal the unit may have for visitors.
W	
Water Yield	The measured output of the Forest's streams.
Wetlands	Areas that are inundated by surface or ground water with the frequency sufficient to support and under normal circumstances does or would support a prevalence of riparian vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, overflows, and mudflats.
Wilderness	Under the 1964 Wilderness Act, wilderness is undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation. It is protected and managed so as to preserve its natural conditions which 1) generally appear to have been affected primarily by the forces of nature with the imprint of man's activity substantially unnoticeable; 2) has outstanding opportunities for solitude or a primitive and confined type of recreation; 3) has at least 5,000 acres or is of sufficient size to make practical its preservation, enjoyment, and use in an unimpaired condition, and 4) may contain features of scientific, educational, scenic, or historical value, as well as ecologic and geologic interest.
Wildfire	Any wildland fire that requires a suppression response.
Withdrawal	An order removing specific land areas from availability for certain uses.
Work Year Equivalents	Approximately 2,000 working hours. May be filled by one person working yearlong or several people filling seasonal positions.



West Fork Cottonwood Canyon Big Snowies.

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