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Forest Service

Northern Region

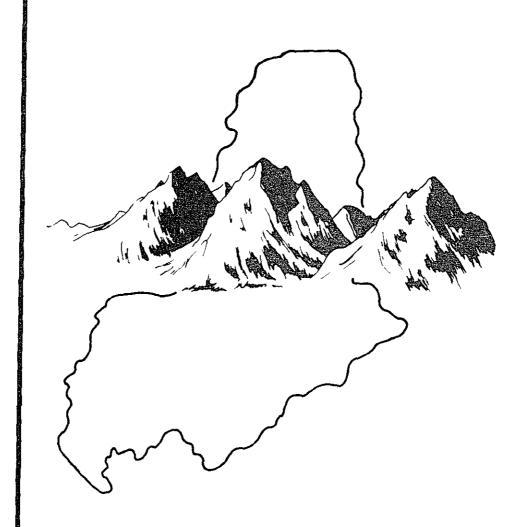


September 1987

## VOLUME II Appendices

# FINAL ENVIRONMENTAL IMPACT STATEMENT

**Bitterroot National Forest Plan** 



#### VOLUME II

#### APPENDICES

#### FINAL ENVIRONMENTAL IMPACT STATEMENT

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#### APPENDIX A

#### IDENTIFICATION OF ISSUES, CONCERNS AND OPPORTUNITIES

#### A. Introduction

A preliminary scoping of issues and concerns was completed by August 1980. Past planning actions and public involvement activities, along with current management concerns, led to the original listing of tentative issues.

A letter was mailed August 1980 to persons who previously indicated an interest in the Forest Plan. Included were times and dates for public workshops to be held as part of the issue identification process. There were  $2^{4}$  responses to this initial mailing.

A news release announcing Forest Plan workshops was distributed to local media. Workshops were held in Stevensville, Darby and Hamilton on October 14, 15 and 16, 1980. Planning team members and District staff conducted the workshops using the nominal group process. A total of 49 people attended. Similar workshops were held at the Supervisor's and District Offices for Forest employees in which 108 individuals participated. Some 500 issues were identified and ranked at these workshops.

In addition, a letter containing background information on Forest Planning and tentative issues was sent to Idaho and Montana state clearinghouses; Salish, Nez Perce and Confederated Kootenai-Salish tribal groups; and Missoula, Ravalli and Idaho County commissioners.

The Notice of Intent to prepare a Forest Plan and Environmental Statement was published in the Federal Register in December 1980.

In January 1981, a letter outlining the Forest planning effort, background information and tentative issues was sent to about 650 adjacent and intermingled private land owners. Eighteen individuals responded.

Letters and phone calls were received from a total 47 respondents. The following affiliations were represented: 8 individuals owning land adjacent to or within the Forest boundary, 2 conservation groups, 2 recreation groups, 1 media representative, 5 industry or industry-related groups, 4 public agencies, 2 Indian tribes and commissions. Responses were received from: Montana, Idaho, California, Oregon, Colorado, Texas, Ohio, Washington D.C. and Nevada.

Over 600 items identified at workshops and in letters or phone calls were initially grouped by MIH (Management Information Handbook) codes. This list was reviewed by the interdisciplinary team to sort which issues could be addressed by the Forest Plan; which could be or have been resolved by laws, regulations or current policy; and those not resolvable at the Forest level.

Issues of similar nature which could be addressed in the Forest Plan were summarized by issue statements. These statements were reviewed by the team. The statements were then divided among team members and each wrote a summary of public comment to fit each statement. The entire team then reviewed the summaries and statements. A cover letter was written and the issues and summaries mailed to workshop participants and those responding prior to January 20, 1981.

The next phase of issue analysis was writing problem statements for each of the issues. Work groups with District and Supervisor's Office representatives wrote problem statements, management concerns and opportunities for each issue.

The interdisciplinary and management teams determined major issues to be addressed in the Plan in the design of alternatives and in the FORPLAN model. The following criteria were used: ranking of issues at workshops, history of the issue, perceived intensity of conflict surrounding the current issue and expected duration of the issue. The Regional Forester approved six major issues: timber harvest, visual quality, wildlife and fish, watershed, roadless (undeveloped) area, and Montana Wilderness Study Act area recommendation.

Additional public involvement was initiated in September 1983, to aid in resolution of the roadless (undeveloped) area issue. Prior to this, Forest planning had examined a broad range of uses for roadless areas but had not included an evaluation for wilderness designation except for Montana Wilderness Study Areas.

The Forest received 239 responses to requests for comment on the roadless issue. Seventy-eight percent of the responses were from Ravalli County. Respondents included: industry and industry related groups - 10; conservation groups - 7; and other agencies - 2. About 60 percent of the responses opposed additional wilderness designation and about 30 percent supported some wilderness allocation. Of the 11 roadless areas being evaluated, those receiving the most support for wilderness designation were: Selway-Bitterroot, Blue Joint, Sapphire, Swift Creek, Stony Mountain, Needle Creek and North Big Hole.

Following release of the Draft Environmental Impact Statement (DEIS) and Forest Plan (FP) in March 1985, three open houses were held in Stevensville, Darby and Hamilton, on May 21-23 and May 28-30. The purpose of these meetings was to provide information and clarification on the DEIS and the Forest Plan. Eighty-eight people attended. Also, eight meetings were held with various interest groups. Sixty-three people attended. The meetings generally focused on specific concerns such as fish, timber economic efficiency and timber supply. On December 11 and 12, formal hearings were conducted in Hamilton and Philipsburg on the Blue Joint and Sapphire Wilderness Study areas, as required by the Montana Wilderness Study Act (PL 95-150).

Approximately 1,000 letters were received in response to the DEIS/FP. Almost all of the comments were relevant to the six major issues developed at the start of the planning process. The original issues are still relevant and no modification was necessary; however, public comment did serve to clarify concerns associated with each issue statement.

#### B. Consultation with Others

#### 1. Agencies and Indian Tribes

#### a. Contacts

The following agencies and Indian tribes are on the Forest Plan mailing list. They received Forest Plan Notes which provide information on status of the plan, comments requested and public meeting dates.

Bitterroot Conservation District, Hamilton, Montana

Bitterroot RC&D, Hamilton, Montana

Bonneville Power Administration, Kalispell, Montana

Bureau of Land Management, Boise, Idaho

Bureau of Land Management, Missoula, Montana

Bureau of Land Management, Washington, DC

Columbia River Inter-Tribal Fish Commission, Portland, Oregon

Environmental Protection Agency, Helena, Montana

Five Valleys District Council, Missoula, Montana

Flathead Culture Committee, St. Ignatius, Montana

Hamilton City Council, Hamilton, Montana

Hamilton Unit Forester, State of Montana, Hamilton, Montana

Heritage Conservation & Recreation Services, Denver, Colorado

Idaho ASCS, Boise, Idaho

Idaho Air Quality Bureau, Boise, Idaho

Idaho Attorney General, Boise, Idaho

Idaho Department of Fish & Game, Boise, Idaho

Idaho Department of Parks & Recreation, Boise, Idaho

Idaho Division of Aeronautics & Public Transportation, Boise, Idaho

Idaho Natural Resources Advisory Board, Silverton, Idaho

Idaho State Clearing House, Boise, Idaho

Idaho State Conservationist, Boise, Idaho

Idaho State Planning & Community Affairs Agency, Boise, Idaho

Missoula County Planning Office, Missoula, Montana

Montana Department of Fish, Wildlife, & Parks, Helena, Montana

Montana Department of Fish, Wildlife, & Parks, Missoula, Montana

Montana Department of Forestry, Missoula, Montana

Montana Department of Health & Environmental Sciences, Water Quality Bureau Helena, Montana

Montana Department of Natural Resources and Conservation, Conservation Districts Division, Helena, Montana

Montana Department of Natural Resources & Conservation, Environmental Coordinator, Helena, Montana

Montana Historic Preservation Office, Helena, Montana

Montana State Clearing House, Helena, Montana

Montana State Division of Forestry, Kalispell, Montana

Montana State Soil Conservation Commission, Helena, Montana

Mountain Plains Federal Regulatory Council, Denver, Colorado

Property Assessment Division, Staff Forester, Helena, Montana

Public Land Law Review Commission, Helena, Montana

Ravallı County Planning Office, Hamilton, Montana

U.S. Army Corps of Engineers, Seattle, Washington

- U.S. Bureau of Public Roads, Helena, Montana
- U.S. Geological Survey, Helena, Montana
- USDI Bureau of Indian Affairs, Portland, Oregon
- USDI Fish & Wildlife Service, Boise, Idaho
- USDI National Park Service, Denver, Colorado
- USDI National Park Service, Omaha, Nebraska
- Western Regional Parks of Canada, Calgary, Alberta

#### b. Review of Plans

The following plans from other agencies were reviewed to assess their relationship with the planning effort:

- USDI National Park Service, Lewis & Clark National Historic Trail Status Report -Goal is protection of the historic route and remnants. Portions of the trail are National Forest land from Lost Trail Pass down Camp Creek to Ross' Hole up Reimel Ridge to Gibbons Pass.
  - -The Camp Creek area has been extensively modified by fire suppression, timber harvest, and cattle use.
  - -Gibbons' Pass to Ross' Hole probably resembles closely the country as Lewis and Clark saw it. May need restrictions on timber harvest and road construction along this portion.
- Soil Conservation Service, Annual Plan of Operations -- FY 1981
  - -Need for SCS, Forest Service, and grazing permittees to cooperate.
  - -Issues:
    - -Increased marketing of woodland products.
    - -Destruction of key big-game winter range due to overgrazing and urban buildup.
    - -Need streambank sterilization, i.e., fencing livestock out of sensitive areas, or establishing shrubs.
- Montana Department of Fish, Wildlife, and Parks, 1978 Montana State-wide Comprehensive Outdoor Recreation Plan
  - -Sets harvest goals for elk, mule deer, bighorn sheep, moose, and mountain goat. Outlines strategies for managing habitat for these species, including:
    - -Road closures, walk-in hunting areas.
    - -Use of cooperative elk-logging study recommendations when planning timber sales.
    - -Build minimum number of roads.

Ravalli County, Comprehensive Plan of Ravalli County, 1981

- -Goals generally are same as issues raised for Forest Plan:
  - -Preserve and enhance historic sites and structures.
  - -Provide for orderly development and economic growth.
  - -Maintain and conserve natural resources.
  - -Maintain and conserve water quality in Bitterroot River and its watersheds. Shortage of water during late summer and fall is a continuing problem for agriculture, fisheries, and recreation users.
  - -Sustain timber level to maintain a stable industry.
  - -Encourage land use policies that promote the natural environment and appeal to the public for recreation, tourism, and retirement living.

- Missoula County, Missoula County Comprehensive Plan, 1975

  -The plan recognizes the role that natural resources play in the lifestyle of Missoula County residents.
- SCS, ERS, FS, MDNRC, Clark Fork of the Columbia River Basin Study, 1977 -- Identification of water development potential includes increasing the storage capacity of Lake Como and developing additional water storage sites.
- MSU Cooperative Extension Service, Project '80 What the People Said -Some issues correspond to those identified in Forest Planning:
  - -Fish/wildlife agency coordination.
  - -More rangeland, less wilderness.
  - -Air quality.
  - -Noxious weed control.
  - -Develop alternative energy sources and encourage oil and gas drilling.
- U.S. Department of Energy, Bonneville Power Administration, Pacific Northwest Long-range, East-west Energy Corridor Study, Phase I, 1977 -Corridor R-26 Lolo Pass, corridor R-27 up East Fork and across Sapphire Divide, corridor R-28 up West Fork and along Magruder Road, and corridor R-29 Lost Trail Pass. Corridors reflect general capability for linear facility siting and are not planning units. Site-specific studies would be conducted before determining any facility locations.
- Montana Department of Natural Resources and Conservation, A Feasibility Study for a Streambank Stabilization Program for the Bitterroot River, Montana, 1981
  - -Report concludes the Bitterroot River is inherently unstable and can be classified as a braided stream which will continue shifting within the flood plain.
- Bitterroot Conservation District, Long-range Plan for Soil and Water Conservation, 1980
  - -One of the long-range goals is to increase water storage capacity, new dam construction, and hydroelectric generator at Painted Rocks Dam.
- USDA, Bitterroot Resource Conservation and Development (RC&D) Project.
  - -Several objectives relate to Forest planning:
    - -Enhance environmental values.
    - -Provide for area's domestic, agricultural, recreation, and industrial needs.
    - -Conservation to minimize soil erosion and water loss.

#### 2. Other Consultations

Group: Local Timber Industry--Inland Forest Resource Council, Missoula White Pine Sash, Stoltze-Conner Lumber Company, and Champion International

Contact: Discussions about timber inventory and yield tables; costs of timber management activities; suitability of lands for timber production; concerns about programed sell reduction and consequences for local mills and restrictive constraints on timber production; analysis of the management situation results; and alternatives.

Group: Burlington Northern Railroad

Contact: Team discussed landownership problems.

Group: Mineral, Oil, Gas Interests--Oil and gas lease applicants, Mineral claimants, Meridian Land and Mineral, Montana Bureau of Mines, Union Oil Company of California, American Smelting and Refining Company, American Mining Congress, Brent Mining, Inc., ARCO, Western Montana Mining Association, Montana Mining Association, Independent Petroleum Association of Mountain States, Western Reserve Oil Company, and Montana Division, Rocky Mountain Oil and Gas Association

Contact: All received a Forest map with 34 roadless areas identified. Respondents were asked to rate the areas for oil/gas, uranium, geothermal, and other mineral potential. Thirteen comments were received. They were consolidated into a final rating for each area.

Group: Western Environmental Trade Association (WETA)

Contact: Discussions of Forest planning process, including issues and concerns, and need to include minerals, oil, and gas as an issue.

Group: Citizens Against Clearcutting Downing and Ward Mountains; Ruth Centers

Contact: Phone conversation with Bob Bigler regarding scenic classification for the faces of Downing and Ward Mountains.

Group: Sierra Club, Montana Wilderness Association, Trout Unlimited, Defenders of Wildlife, and "Local Citizens of the Bitterroot Valley"

Contact: Interdisciplinary team met with Dave Carr who presented a "Citizen's Alternative for the 1982 Bitterroot Forest Management Plan."

Group: State of Montana Planning Task Force--Governor's Office and representatives from the following Departments: Agriculture; State Lands; Natural Resources and Conservation; Fish, Wildlife, and Parks; Health; Commerce; and Livestock.

Contact: Interdisciplinary team discussed management schemes and outputs of eight alternatives and tentative proposed action.

#### C. Selected Issues, Concerns and Opportunities

#### 1. Issues Addressed in the EIS

## a. What Timber Harvest Level can be Sustained and How Much Should be Offered and Sold in the Planning Horizon (50 Years)?

Public opinion is sharply divided between those who feel the allowable sale quantity established by past plans can be sustained and those who do not. Annual sales averaged 32 million board feet from 1976-80 and 28 million from 1971-80. Key factors in this issue are the determination of lands suitable for timber production; management of 405,000 roadless acres or 48 percent of the Forest outside wilderness; the cost efficiency of timber management; and the effect of harvest level on short- and long-term economic stability and diversity in the local community. There is conflict between managing the Forest for timber and for other resources, especially visually sensitive landscapes, riparian zones and roadless recreation areas. The effects of past harvest activities are still an issue, especially the use of clearcutting. The issue of managing only lands with a positive present net value is critical to many publics. Also, the mountain pine beetle is infesting lodgepole pine stands to the east, west and north of the Forest. The insect damage risk of stands on the Forest needs to be assessed.

Nearly half of the respondents mentioned timber in their comments. The full range of opinion was expressed from those favoring no timber harvest to those advocating the maximum timber output of about 45 MMBF per year in the first decade. Rationale for high timber outputs were dependency of local mills on a high level of raw materials, not letting timber go to waste, contributions to the local economy including the 25% fund, and advisability of managing timber resources intensively. Major concerns for high timber outputs were the possibility of below cost sales, visual impacts, recreation values relative to timber values, incorrect determination of lands suitable for timber production, the amount of roads necessary for timber harvest, the effect of roads on sediment production and fisheries, and questions about timber values used in the economic analysis.

Specific questions asked included: Can we justify below-cost timber sales, when, where? Should we build roads and harvest timber to the point of affecting the fish population? Do we have an obligation to maintain employment in the wood products industry, at what level, what management intensity? Are there viable alternatives to clearcutting? Are we meeting our reforestation responsibility?

## b. To What Extent Should Visual Quality Considerations Influence Management Activities?

Since nearly 40 percent of the nonwilderness area is visible from major travel corridors or population centers, there is a demand for maintaining the Forest's natural appearance. This creates conflicts over the visual impacts of timber harvest and road construction. In addition, there are large areas on the Forest recovering visually from past management practices. There is strong public sentiment against one of those practices—clearcutting. There are also concerns about the resulting high costs of timber harvest when meeting visual quality objectives. The annual sale quantity is affected by visual quality and by areas recovering from past activities.

About 12 percent of the comments on the DEIS and Plan were on the visual resource. Some thought the visual standards were too restrictive and others thought a higher level of visual quality should be maintained. We were asked to show timber harvest costs required to meet visual quality standards. About five percent of total comments, mostly from residents of the Ward and Downing Mountain area, would like the area maintained in a natural state. A few would allow helicopter logging without clearcuts. Some comments favored visual restrictions for more of the Bitterroot face and others said proposed management on the face is too restrictive.

Specific questions were: Should the management direction for the Ward-Downing mountain area be extended to other areas? What use or combination of uses would maximize net public benefits or present net value in the Ward-Downing area? How can we keep options open for vegetative manipulation, such as wildlife habitat improvement and fire management in the Ward-Downing area? Can we live with visual quality objectives lower than inventoried objectives?

## c. How Should Forest Lands be Managed to Sustain Wildlife and Fish Populations?

Fish and wildlife are considered important Forest resources to be managed on an equal basis with timber and grazing. There is conflict between maintaining wildlife habitat and other uses. Intensive timber management tends to reduce old growth, snags and cover, while also changing riparian area. Past tree planting has tended to create monocultures. Fuelwood gathering and slash disposal have reduced dead and down material necessary for small wildlife species. However; large concentrations of deadwood may impede big-game movement. Intensive fire control has changed successional processes. Wildlife habitat management is limited by law, regulation and policy in wilderness. Wilderness reservoirs are managed for irrigation which is often detrimental to fisheries habitat. Traffic on Forest roads disturbs animals. Improper road location and maintenance have caused siltation of fish habitat. Riparian zones, probably the most critical wildlife habitat, have been affected by cattle grazing, slash disposal, mining, roads and concentration of recreation use.

The elk population is a particular concern on the Forest because of the high value placed on elk by regional and national publics. There is strong public support to maintain or increase the population and provide additional hunting opportunities. Since about 40 percent of big-game winter range in the Montana portion of the Forest is on private land, increasing the population on the Forest will affect adjacent landowners. Managing forage for big game and livestock is complicated by limited forage, concentration of forage in riparian zones and difficulty in distributing range animals.

About 25 percent of the comments mentioned wildlife and 20 percent fish or fish habitat. The majority of comments stated that a decrease in fish population, increase in sediment and/or reduction in hunting opportunity are not acceptable. Fish population estimates were thought to be in error, proposed water quality monitoring inadequate and economic values for hunting too low.

Respondents thought we should consider the cumulative effects of private and National Forest land management practices on fish and sediment through the entire Bitterroot river system.

Several comments on winter range management suggested we adopt the elk-logging guidelines, that timber harvest does not increase forage, and that road density standards allow too much roading. Others thought an increase in timber harvest would allow for an increase in elk populations. One respondent thought elk herds have increased since the 1930's.

The ecological importance of old growth was mentioned. Some thought we proposed to maintain too little, but others contend none is needed on lands suitable for timber harvest.

One respondent opposed the introduction of grizzlies and wolves, and another opposed felling trees into streams to improve fish habitat.

How or should we manage National Forest land to compensate for management of adjacent private lands? How should elk winter range be managed? What level of fish population reduction is acceptable? What are downstream effects of National Forest management? How or should old-growth requirements on suitable timberland be changed?

d. How can Watersheds be Managed to Maintain or Enhance Water Quality, Soil Productivity and Desirable Streamflow?

Many local residents feel water is the most valuable Forest resource and think water quality and quantity should receive first consideration in management. Most of the irrigated acreage in the Bitterroot Valley depends on water originating on the Forest. The Forest's annual water yield of 1.7 million acrefeet can supply the 117,000 acres irrigated. The problem is that water flow is low during the high demand period and that timber harvest advances and increases snowmelt runoff but does not increase late season flows. Future water development for irrigation, household use or hydropower development may conflict with fisheries, recreation and wildlife instream flow needs. Roads are the major factor in increasing sediment in streams above natural levels. Riparian zones are among the most productive sites for timber, wildlife and forage and the most desirable sites for intensive recreation.

There is concern for the development of steep areas located on granitic soils. A large portion of the undeveloped lands on the Forest are very steep and sensitive to disturbance. These soils have high erosion and/or stability hazards, are subject to soil compaction and can be irreversibly damaged by displacing the very thin surface loess cap. They can also be extremely gravelly and difficult to regenerate.

Most of the comments about water and watershed management related to the effects of proposed management practices on sediment yield and fish populations. Many respondents were concerned about the effect of timber harvest on water yield and stream flow timing. There was consensus that water is one of the most important resources of the Forest.

#### e. How Should Undeveloped Roadless Areas be Managed?

There are about 405,000 acres of undeveloped roadless country in 11 areas outside wilderness on the Forest. Various segments of the public support one of three philosophies for management of all or portions of the 11 areas: (1) manage as wilderness, (2) manage for roadless but motorized recreation with no timber harvest, or (3) build roads and manage for timber production.

About 47 percent of the Forest is classified wilderness. Congress has mandated study of the Sapphire and Blue Joint areas for possible inclusion in the National Wilderness System. A segment of the public supports wilderness designation for these two areas and the other 290,800 acres of undeveloped forest land. All 11 areas either meet the minimum size requirement for wilderness or are adjacent to existing wilderness.

Another segment of the public thinks there is a need for management of large blocks of land without roads but with motorized equipment allowed. This philosophy could allow minor developments such as permanent, semiprimitive campsites or snowmobile and motorbike trails. Other management activities, such as prescribed fire to create or improve wildlife habitat, could be allowed if no roads were required.

There is no formal process nor definition for designating backcountry. The designation would be administrative with management guidance established by the management prescription for each area.

Another portion of the public supports full development and management for timber production on the productive portions of all the areas. A significant portion of the Bitterroot Valley economy is in the wood products sector and any reduction in the land base for timber production will ultimately affect timber outputs and therefore wood industry and related jobs.

Many commentors on the DEIS suggested all currently roadless areas should be protected from development by wilderness designation. Another large number of commentors advocated no special protection with the land suitable for timber harvest to be included in the timber base. A few people suggest a need for roadless, semiprimitive motorized recreation. Some suggested timber harvest is OK, but it should be done without roads. Several commentors were concerned with the apparent reduction of area allocated to roadless management in the Unit Planning process of 10 or more years ago. Several people questioned the rationale for allocating suitable timberlands to roadless management.

Specific questions included: Where and how much should we expand the wilderness system? Is there a need for roadless, semiprimitive recreation areas? What are the greatest economic values in roadless areas?

### f. What Management Should be Recommended for the Blue Joint and Sapphire Wilderness Study Areas?

The Montana Wilderness Study Act of 1977 requires these two areas of 109,000 acres on the Bitterroot Forest be studied for possible addition to the National Wilderness Preservation System. Management options range from wilderness classification to management for nonwilderness values. The conflict in this issue is whether more wilderness is needed on the Forest, since 47 percent is presently classified wilderness, or whether the need for wilderness should be determined on a national or state basis and related to long term needs.

#### (1) Issues Identified in Public Workshops during 1979

- What other Federal lands are classified, proposed or under study as wilderness in the surrounding area and to what extent should they influence classification of the study lands?
- What is the amount and kinds of recreation opportunities the area presently supports or is capable of supporting?
- What are the principal game, nongame and threatened or endangered species and what are the opportunities for habitat improvement?
- What type, condition and amount of road and trail access does the area contain and what is the potential for roaded forms of access?
- What is the current type and amount of motorized vehicle use and what is the potential for that use?
- How important are economic efficiencies and impacts in determining the level and location of resource development opportunities?
- What is the present condition and what are the present uses of the area's watershed; what is its relative sensitivity to development activities?
- What is the timber potential of the area and where is management the most suitable?
- What is the hardrock, oil and gas potential of the area and how should the area be managed in relation to that potential?
- What are the present uses, locations and opportunities for cutting household firewood and what other energy needs such as powerline corridors should be considered?
- What is the present range use of the area and what is the potential for that use?
- What is the present condition and the potential for serious fire and/or insect and disease infestation; what are the current protection measures and what measures are needed?
- What esthetic values does the area contain and how should these values be protected?

The Blue Joint Montana Wilderness Study Act (MWSA) area received the most comments of any roadless area and most of these were supporting wilderness for the entire area. Supporters cited high wildlife, watershed and recreation values; low timber values; steep slopes; and unique meadows as reasons for recommendation to include the area in the wilderness system. Nonwilderness supporters want to allow motorized use.

The Sapphire MWSA area drew most support for wilderness classification because of wildlife habitat, watershed values, and the contention that timber harvest would be below cost. Those supporting multiple use thought the area is not much different from the rest of the forest and could be managed to support motorized use and timber harvest without degradation.

The MWSA required formal public hearings separate from the public involvement process for the Forest Plan. Hearings were held in Philipsburg and Hamilton in mid December, 1985. Some supported wilderness classification for both areas because they have high wildlife, recreation, watershed and aesthetic values and low timber values. Others cited the economic necessity of maintaining a supply of timber for local mills, high timber values in parts of the area, and the desire for motorized access.

Most of the respondents to the Forest Plan who mentioned a specific roadless area were interested in having the area classified as wilderness or at least left unroaded. About 250 people were for more wilderness and most mentioned a specific area. About 370 people were against any addition to the wilderness system, but virtually none of these respondents mentioned a specific area.

#### 2. Concerns and Opportunities

- a. To what extent and where should the Bitterroot National Forest be managed for specific types of recreational activities?
- b. How should the Forest road and trail system be developed and managed to meet resource management objectives?
- c. How can the Forest be allocated and managed to help provide for the Nation's mineral needs?
- d. What opportunities exist to better utilize dead timber for firewood and other purposes?
- e. Are there rivers or streams eligible for study as potential additions to the Wild and Scenic Rivers Act?

#### 3. Issues Deferred for Resolution Outside the Forest Plan

The following is a summary of issues that could not be addressed by the Plan:

- -Use of motorized equipment in wilderness.
- -No development in wilderness.
- -Use timber in wilderness.
- -Develop small dams.
- -Better methods of utilizing slash and other wood products.
- -Timber productivity classes are too high.
- -Forest's timber harvest is not cost efficient compared to other sections of the country.
- -Promote small sales.
- -Over-regulation on road construction and use.
- -Inadequate knowledge for long-range decisions.
- -More public education on wilderness management fires.
- -Greenbelt zoning.
- -Develop mineral potential.
- -Increase knowledge of forest soils and productivity.
- -Personnel, budgeting and financing concerns.
- -Wildlife management outside Forest Service authority.
- -Acid rain and the greenhouse effect.

#### 4. Response to Issues

#### a. Design of Alternatives

Alternatives were designed to respond differently to the six major issues: timber harvest level, visual quality, wildlife and fish habitat, soil and water quality, undeveloped (roadless) areas, and Montana Wilderness Study Areas. FORPLAN was modeled to allow a range of responses to these issues. None of the selected issues were deferred for resolution outside the planning process nor treated the same in all alternatives.

#### b. Capability to Respond

The interdisciplinary team determined the Forest's capability to respond to issues during the inalysis of the management situation. Determination of a potential supply range for various resources was based on habitat capability. See Appendix B, Section VIII for a full discussion of the capability, effects on present net value, and tradeoffs.

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#### APPENDIX B

#### DESCRIPTION OF THE ANALYSIS PROCESS

#### I. INTRODUCTION

#### A. Planning Problem

The Forest Service is responsible for determining how best to manage National Forest lands based on public desires and land capabilities. The capability of the Bitterroot National Forest is influenced by its mountains with rocky, jagged peaks and forested slopes with short growing seasons and sandy soils. Half the Forest is currently wilderness. The remainder of the Forest supports roaded and unroaded recreation include big-game hunting and viewing scenery; harvesting timber; and domestic grazing. Forest resources help support a local recreation- outfitter industry, a local woods products industry, numerous water users, and some livestock permittees.

Public interest includes divergent viewpoints about the use of commodities such as timber, grazing and minerals and noncommodities such as wilderness, unroaded recreation, scenery, wildlife, old growth and diversity. The Forest's major planning goal is to provide enough information to help decision makers determine which combination of goods, services and land assignments will maximize net public benefits (NPB). NPB is the net value of priced outputs plus the net value of nonpriced outputs. The National Forest Management Act (NFMA) and the regulations developed under NFMA (36 CFR 219) provide the analytical framework to address this objective, and also state that the requirements of the National Environmental Policy Act (NEPA) and its regulations (40 CFR 1500-1508) must be applied in this analysis process.

#### B. Planning Process

The planning and environmental analysis process brings a new outlook and a new technology to National Forest land management, principally: (1) processes formerly used to make individual resource decisions are now combined to help make integrated management decisions, and (2) new mathematical modeling techniques are used to assist in the land assignment problem including identifying the most cost-efficient pattern of land management. The 10-step planning process is discussed in the NFMA regulations and in Chapter I of this document. Appendix B describes the analysis phase of this process including planning steps 3, 4, 5 and 6. The judgement phase, planning steps 1, 2, 7 and 8, is described in Chapters I, II, and in Appendix A. The execution phase, planning steps 9 and 10, is presented in the Proposed Forest Plan.

#### 1. Inventory Data and Collect Information (Planning Step 3)

The interdisciplinary team determined what data was necessary based on the issues and concerns. The analysis of the management situation, formulation of alternatives and monitoring require data on resource capabilities, existing supply and demand, expected outputs, benefits and costs. Existing data was used whenever possible but was supplemented with new data to help resolve sensitive issues or management concerns. Data is on file in the Forest Supervisor's Office.

#### 2. Analysis of the Management Situation (Planning Step 4)

This analysis examines resource supply and market conditions and determines suitability and feasibility for resolving issues. A land assignment model (FORPLAN) was used to address a number of specific requirements, including benchmarks. Requirements include: (a) the projection of the Forest's current management direction; (b) determining the Forest's ability to produce a range of goods and services from minimum management to maximum production; (c) evaluating the feasibility of reaching the national production goals (RPA assignments) and social demands identified as issues and concerns, and (d) identifying monetary benchmarks which estimate the output mix which maximizes present net value (or minimizes the cost) of resources having an established market or assigned value. See Forest Planning Record: Analysis of Management Situation and Alternatives.

#### 3. Formulation of Alternatives (Planning Step 5)

The information gathered during the first four planning steps is combined and analyzed to formulate alternative management plans. The alternatives reflect a range of resource management direction. Each major public issue and management concern was addressed in one or more alternatives. Management prescriptions and practices were formulated to represent the most cost-efficient way of attaining the objectives for each alternative. Both priced and nonpriced outputs are considered in formulating the alternatives. The formulation of alternatives is documented in Planning Record: Analysis of Management Situation and Alternatives.

#### 4. Estimate Effects of Alternatives (Planning Step 6)

The physical, biological, economic and social effects of each alternative were estimated and analyzed to determine how each responds to the range of goals and objectives assigned by the RPA program FORPLAN was used to estimate some of the economic and physical output effects while other methods were used for remaining effects. The analysis included: (a) direct effects; (b) indirect effects; (c) relationship with other federal, state, local and Indian tribe land use plans; (d) other environmental effects; (e) energy requirements and conservation potential; (f) natural or depletable resource requirements and conservation potential; (g) historic and cultural resources; and (h) means of mitigation.

#### II. DATA INVENTORY AND INFORMATION COLLECTION

#### A. Forest Data Base

#### 1. Capability Areas

The basic resource data storage unit is the capability area. Capability areas are land units delineated for the purpose of estimating their response to various management practices, resource values, production coefficients, and multi-resource functions (FSM 1920.5). Approximately 10,000 capability areas were delineated on the Forest. Forest capability areas were based on the following criteria.

#### a. Watershed

The national system of delineating hydrologic units was used to identify water-sheds and subwatersheds (USDI, 1976). Eighteen watersheds were identified of which seven are completely in existing wilderness. The watersheds provide a means to separate data for Idaho and Montana.

#### b. Compartments

Timber inventory compartment boundaries were utilized as subdivisions of subwatersheds to provide a link to the timber data base. The 197 compartments also provide a means to separate data for Missoula and Ravalli Counties in Montana.

#### c. Habitat Type and Land Type

The basic capability unit was identified by the combination of vegetative habitat type, an indicator of biological potential; and land type, an indicator of physical characteristics such as slope, aspect and elevation. Thirty-five habitat types and 209 land types were identified.

#### 2. Analysis Areas

Analysis areas are one or more capability areas or parts of capability areas combined for the purpose of analysis in formulating alternatives and estimating various impacts and effects (FSM 1920.5). Capability areas were further stratified by existing timber types or condition classes and then aggregated into analysis areas based on similarities in capability, timber types, and economic effects. There are 312 analysis areas delineated on the Forest.

#### 3. Production Coefficients

Resource outputs were developed for each analysis area by linking resource suitability and management prescriptions to analysis areas. Analysis areas suitable for timber production were linked to timber type maps which were linked to timber outputs. Analysis areas suitable for cattle grazing were linked to range allotment maps which were tied to forage production estimates. Analysis areas suitable for elk winter range production were tied to elk winter range forage estimates. Recreation coefficients were tied to population trends in Western Montana. Water and sediment coefficients were developed for both naturally occurring and management induced erosion. Other resource data including slope, geology, and riparian zones were utilized to further refine or constrain outputs.

Production coefficients used on Forest were expressed in the following units:

Timber
Dispersed recreation
Winter elk forage
Summer elk forage
Livestock forage
Water
Road construction
Sediment (road-related)

Sediment (timber harvest-related)

Thousand cubic and board feet/acre
Recreation visitor days/acre/year
Pounds/acre/decade
Pounds/acre/decade
Pounds/acre/decade
Acre-feet/acre/decade
Miles/thousand acres/decade
Tons/thousand acres/decade
Tons/thousand acre/decade

#### 4. Suitable Lands

Forest personnel used resource data to determine acres tentatively suitable for management practices. All areas were considered suitable for some form of recreation and some type of wildlife use. Roadless area size and evidence of human activities were used to determine wilderness suitability. Forest habitat type, soils, timber condition class, and legal status were used to determine areas tentatively suitable for timber production (Table B-1). Forest habitat type and slope were used to determine areas suitable for domestic livestock management practices. Habitat type and Department of Fish, Wildlife and Parks inventory were used to determine areas suitable for elk winter range.

Table B-1 Land Classification Summary

	Wilderness Acres	Other Acres	Total Acres
Nonforest land including water 1/ Forest land	285,674 457,408	69,039 765,762	35 <sup>4</sup> ,713 1,223,170
Forest land withdrawn from timber production - wilderness Forest land not capable of producing	457,408	0	457,408
industrial crops of wood 2/ Forest land physically unsuitable	0	0	0
Irreversible damage likely to occur 3/	0	0	0
Not restockable within 5 years 3/	0	34,533	34,533
Forest land - inadequate information $\frac{4}{4}$	0	144,897	144,897
Tentatively suitable forest land	0	586,332	586,332
Montana Wilderness Study Area portion	0	71,266	71,266
Remainder of tentatively suitable	0	515,066	515,066
Unsuitable forest land	457,408	179,430	636,838
Total National Forest land	743,082	834,801	1,577,883

<sup>1/</sup> Nonforest land was identified as all nonforest habitat types on Forest Plan maps: mountain meadows, mountain grassland, foothill grassland, mountain brush, rockland, talus, and scree (Planning Records, 1982).

<sup>2</sup>/ The DEIS classifies 278,141 acres as "not capable of producing industrial crops of wood" which are mostly lands producing less than 20 cubic feet/acre/year. Based on the suitability criteria in Forest Service Handbook (FSH) 2409.13-21, 102,244 acres were reclassified as "Forest land withdrawn from timber production - wilderness", 33,324 acres as "Not restockable within 5 years, and 144,897 acres were reclassified as "Forest land - inadequate information".

- 3/ There are two categories of "Forest land physically unsuitable" which are classified as "Irreversible damage likely to occur" and "Not restockable within 5 years". The criteria for identifying these unsuitable lands are as follows:
  - a. The Forest has several hundred acres of Forest land where irreversible damage is likely to occur, but impactive practices, such as roading and clearcutting, will not be prescribed on these sites. Therefore, no acres will be classified unsuitable due to irreversible damage.
  - b. Lands not restockable within 5 years include those which are available and capable but have severe regeneration problems. They are on land types with rocky or stony soils supporting the Douglas-fir/ninebark habitat type with stands of dwarf mistletoe infected Douglas-fir as described in Forest Plan Notes 85 and 86. All ponderosa pine and Douglas-fir bunch grass habitat types and phases were classified as "not capable of producing industrial crops of wood" in the DEIS. These lands are not restockable within 5 years and therefore are added to the 1,209 acres identified in the DEIS rather than the "Forest land inadequate information" category shown below.
- $\frac{4}{1}$  The criteria for identifying "Forest land inadequate information" which are lands for which current information is inadequate to project responses to timber management, are as follows:
  - a. Administrative sites.
  - b. Upper subalpine lands often forested but with very slow growth and current information is inadequate to project response to timber management. These include habitat types subalpine fir/grouse whortleberry (730), subalpine fir/woodrush (830), whitebark pine-subalpine fir (850), and alpine larch/subalpine fir (860).
  - c. Land types 1, 1A, 1AA, 1AB, 1B, 1BA, 1 BAR, 1C, 2OA, and 2OB which typically occur above 7,000 feet in elevation, on convex slopes less than 40 percent; and have soil characterized by shallow, highly fractured rock, 50 percent or more coarse fragments, physical weathering predominant, porous, and no evidence of overland flow with very limited stream dissection.

These land types support the habitat types listed above and the unsuitable portions of the AF/xete habitat type. The combined criteria of habitat type and land type are the most accurate indicators of unsuitable upper subalpine lands. Further explanation of the above habitat and land types can be found in Forest Plan Notes 81 and 96; Pfister and others, 1977; Garn and Malmgren, 1973; and Planning Records, 1982.

d. Rocky lands, often with scattered forest, but information is inadequate to project response to management activities due to limitations and slow growth. Habitat types 690, 290, 470, 520, 620, 630, 670, and 660 in combination with land types G29 (water), 15, 15A, 15AB, 15B, 20, 20A1, 20A2, 20C, 21, 21A, 21A2, 23A2, 25D, 40, 41, 41A, 5B41, and 50. These land types are rocklands, talus, or very thin fragmental or skeletal soils and occur at all elevations. They often support poorly to moderately stocked timber stands. Some of these stands are typed as nonforest or noncommercial forest and some are not. The combined criteria of photo interpretation and habitat and land type delineation with field checking are the most accurate indicators of unsuitable lands (Garn and Malmgren, 1973; and Planning Records, 1982).

#### 5. Assignment and Scheduling

The condition classes of existing vegetation were used to schedule management activities over time for the various benchmarks and alternatives.

#### 6. Monitoring

Forest planning data provides a base from which changes can be measured and will also be used to monitor implementation activities.

#### 7. Plan Implementation Programs

The data base provides biological and physical data that will help develop subsequent programs for plan implementation. As more information is available, the data base will be updated and improved.

#### B. Sources of Data

, A.

Sources of existing inventory data used in the analysis are as follows:

- 1. Forest Service Manual, Management Information Handbook (MIH 1309.11) provided definitions for outputs, activities and effects.
- 2. Vegetative habitat types were inventoried in conjunction with unit plans completed from 1973 to 1977. The process is currently documented in Forest Habitat Types of Montana (Pfister and others, 1977).
- 3. Land types were derived from the most current project or unit plan inventory, Planning Records, 1982, Garn and Malmgren, 1973.
- 4. The national watershed identification system was used to identify regions and subwatersheds on the Forest (USDI, 1976).
- 5. Compartments are the timber compartments identified in the timber inventory system and are subdivisions of the subwatersheds (Planning Records, 1982).

- 6. Administrative boundaries are delineated on the Bitterroot Forest Map, 1981.
- 7. Slope was extracted from U.S. Geological Survey maps.
- 8. Timber outputs were derived from the 1972 timber inventory. Timber types or size and condition classes were developed by Forest Service personnel.
- 9. U.S. Geological Survey maps, 1962-1978, and infrared aerial photos, 1975, were utilized to delineate stream and lake riparian zones.
- 10. The recreation opportunity spectrum was utilized to map opportunities and develop capacity coefficients. The Recreation Information Management System was utilized to develop recreation visitor days: Hunting recreation was developed from Elk and Deer Hunting Opportunity Evaluations (Reid, 1981).
- 11. Elk and livestock forage information was adopted from Range Analysis Handbook, FSH 2209.21-R1; Wildlife Surveys Handbook, FSH 2609.21; Clipping Studies (USDA, nd) and Production Coefficients and Economic Guidelines for Big Game and Livestock, (Reid, 1981).
- 12. Geologic information was developed from Berg (1973), Chase (1961), Clark (1979), Desormier (1975), Jerome (1968), Prestey (1971), Ross (1950), Wahler (1975), Wallace and Klepper (1976), Wehrenberg (1972), Winegar (1973a, 1973b, 1974, and 1975).
- 13. Mineral potential was developed utilizing the McKelvey system and mining claims officially recorded with the Bureau of Land Management.
- 14. Background sediment and sediment from management activities were predicted from: Megahan (1976), Emmett (1975) and USBA (1980):
- 15. Background water and water yields which result from management activities were predicted from Garn (1974):
- 16. The visual resource was mapped using the Visual Management System (VBDA, 1977). Standards and guidelines were developed to meet each visual quality objective (Forest Plan Note 177).
- 17. Stumpage value was based on bidder transaction evidence for 1974 to 1980 and 1975 to 1984; price trends from Haynes and Adams (1980) and USDA (1986) and other resource values (price trends) from 1980 RPA reports (Beasley, 1978). Gosts were developed by Forest personnel as documented in Planning Record: Management Practices.

18. Fish populations are based on the Guide for Predicting Salmonid Response to Sediment Yields (USDA, 1984) and Detailed Instructions for Entering Data Into Interagency Stream Fishery Data Base (USDA, 1980).

#### III. THE FOREST PLANNING MODEL (INCLUDING FORPLAN)

#### A. Overview

This section describes the primary components of the Forest Plan model. The discussion includes the analysis procedures, analytical tools including FORPLAN, and the assumptions and details of analysis areas, prescriptions, and yield coefficients which are used in the analysis.

FORPLAN is a linear programing computer model designed to analyze thousands of possible management activities, practices, and resource outputs on specific land areas in order to select an optimal set capable of meeting various management constraints and goals (objective functions).

The specific land areas or analysis areas were delineated by characteristics which have a fairly uniform response to management activities, costs, and benefits. Management activities and practices were made available to analysis areas based on their suitability (see Part C of this section). Specific combinations of activities and outputs were made available to analysis areas to represent various multiple-use prescriptions called management prescriptions. Each of the 312 analysis areas has 1 to 19 management prescriptions available.

Production coefficients for resource outputs were developed for each combination of analysis area and management prescription. FORPLAN assigns those management prescriptions to analysis areas which produce the goods and services that optimize the objective function, after meeting all constraints.

Alternatives were generated by constraining management prescriptions available to analysis areas, constraining the access to analysis areas for timber harvest in a particular decade, or constraining the outputs from analysis areas or groups of analysis areas. These constraints were designed to achieve the goals of an alternative. The conditions set by the constraints must be satisfied before the objective function is optimized. The analysis of the benchmarks and alternatives utilized the same objective function, to maximize present net value which results in the most efficient alternative. In other words, after meeting all constraints the FORPLAN model assigned the remaining opportunities to produce the highest monetary value.

#### B. Analysis Process and Analytical Tools

Analysis leading up to FORPLAN included designing management prescriptions (Planning Record: Management Prescriptions), assigning practices to prescriptions (Planning Record: Management Practices), developing management costs for each practice and predicting resource outputs (Planning Record: Resource Information Used in FORPLAN), and benefits (Planning Record: Economic Input Information Used in FORPLAN). Outputs predicted include timber yield, elk forage, range forage, water yield, sediment, and roads.

Cost efficiency was considered by the interdisciplinary team while they were developing a realistic and flexible set of management prescriptions. Professional judgment played a major role. FORPLAN was used to examine the comparative cost efficiencies of prescriptions.

Practices which required analysis included roading in riparian zones, road construction, road density, fuels treatment and timber management guidelines for reforestation, silvicultural systems, logging methods, and rotation age. The growth prognosis model was used to develop existing and regenerated managed and unmanaged timber yield tables (Wykoff and others, 1981).

Major decisions that resulted from the preliminary analysis include the following that applied to all prescriptions:

All roads will be built and maintained to Forest-wide standards. Variations occur by land types. Riparian zones will receive special protection. Costs range from \$28,000 to \$49,000/mile depending on slope and soil stability. The benefit is conservation of soil and water resources.

Timber sales will be planned and administered to Forest-wide standards, including coordination with cultural, visual, wildlife, soil, and water resources. Costs range from \$76 to \$153/acre harvested, depending on road access. The benefit is to ensure meeting multiple use objectives, including minimum management requirements.

Timber slash disposal and reforestation activities will take place in all timber harvest prescriptions.

Limited livestock improvements and maintenance were included in all prescriptions assigned to suitable livestock range. The cost is \$0.14/acre/year. The benefit is livestock outputs.

FORPLAN was utilized to provide the basis for optimal land use and management prescription selection and scheduling for each analysis area. This process resulted in selection of the most cost efficient management prescriptions and land use designations that met a given set of constraints and an objective function of maximizing present net value.

Several items were analyzed outside of the FORPLAN model. The baseline socioeconomic conditions for Ravalli and Missoula Counties were identified and an assessment of social and economic impacts developed (Appendix B, section V).

Recreation use projections were modeled using population trends for western Montana and the area designated to wilderness, semiprimitive and roaded uses. Developed and dispersed recreation, wilderness and hunting costs and benefits were analyzed. Roadless areas were mapped (Planning Record: Map file) and their characteristics and use analyzed and ranked. Budgets for recreation, wildlife, range and other costs were developed and analyzed. Receipts from mineral and special-use permits were also estimated.

The impacts of road density and cover removal on elk hunting opportunity were analyzed by Regional standards (Reid, 1981). Elk security areas were mapped (Planning Record, 1982), their importance rated and the effects of accessing them analyzed. Minimum viable populations of all wildlife species were provided for by the inherent diversity requirements of the visual, soil and water minimum management requirements.

Fish populations were modeled using the process outlined in the Guide for Predicting Salmonid Response to Sediment Yields (USDA, 1984). Sediment yields for management activities are predicted in FORPLAN and existing sediment is estimated outside of FORPLAN; both are based on the R1/R4 sediment yield model (USDA, 1980).

Energy consumption was estimated by Regional standards (Reid, 1980).

#### C. Identification of Analysis Areas

The selection of analysis area criteria was based on the need to respond to major public issues. The visual quality, wilderness and roadless issues are spatially oriented issues, the timber issue is output oriented and the wildlife, soil and water issues are related to both. Interdisciplinary and management team analysis of the issues indicated that the criteria should have the ability to respond to: (1) the visually sensitive Bitterroot Mountain face,(2) the wilderness/roadless issue, (3) the amount of road construction required, (4) the area of elk winter range, (5) soil sensitivity or manageability, (6) timber and elk forage productivity, (7) riparian zones, (8) old growth and cover/forage relationships, and (9) existing timber conditions.

The criteria and rationale for delineating analysis areas utilizing the 6 levels provided in FORPLAN follows:

#### 1. Level 1 Criteria

Bitterroot Mountains (D12W) - Available timberland and nonforest land on the west side of Darby and Stevensville Ranger Districts. The purpose is to identify the visually sensitive mountains on the west side of the Bitterroot Valley.

Wilderness (NAVAIL) - Lands not available for timber management on the Forest. All wilderness areas, and wild and scenic rivers within wilderness areas are included.

Remaining Forest (FOREST) - Available timberland and nonforest land on remainder of the Forest including the Magruder road corridor.

These criteria respond to the visual issue by providing the minimum spatial criteria necessary to separate the special costs, benefits, outputs and constraints associated with managing very sensitive scenic areas. They respond to the elk issue since the forested westside winter range can be managed separately from the open forage and forested eastside ranges. The analysis area limitations in FORPLAN prevented the delineation of analysis areas by visual quality objectives.

#### 2. Level 2 Criteria

Roaded (RD) - Available timberland (Level 1 = D12W and FOREST) that is roaded or partially roaded as identified by a recreation opportunity spectrum (ROS) setting of roaded natural or rural in the Forest Plan data base. These analysis areas have been further identified by 5 categories of existing average road miles per section (0.0, 0.5, 1.5, 2.5, and 3.5 miles).

Unroaded (UNRD) - Available timberland that is not roaded and identified as semiprimitive in the Forest Plan data base.

Unsuitable (USNCNA) - All Level 1 = NAVAIL and all habitat type = NCGRAS, NCNFWR, NCSUBA and UNSUIT. (See habitat type criteria for definitions.)

These criteria respond to the roadless area issue by providing a means to assign semiprimitive recreation lands to either roadless recreation or development prescriptions. The criteria also provide a means to quantify the amount of roads and construction costs necessary to develop an area. The limitations in FORPLAN prevent the delineation of lands by all ROS settings. The criteria also respond to the wildlife and fish and water quality issues because roading is a part of these issues.

#### 3. Level 3 Criteria

Winter Range (WTRRGE) - Available timberland and grassland identified as suitable elk and deer winter range, either cover or forage.

Non Winter Range (OTHER) - All available timberland and grassland not identified as winter range.

Unsuitable (USNCNA) - Unsuitable timberland other than grassland including upper subalpine habitats, rockland, talus, and water. (See habitat type criteria for definitions.)

The elk and deer part of the wildlife issue is the basis for these criteria. Constraints can be placed on winter range to accomplish cover/forage or other management objectives.

#### 4. Habitat Type Criteria

Available and suitable timberland identified by the following vegetative habitat type groups:

Douglas-fir habitat types (HT123) (Pfister and others, 1977)

Lodgepole habitat type (HT4) is the subalpine fir/beargrass habitat type.

Mixed conifer habitat type (HT567) includes the more mesic habitat types including subalpine fir/menziesia, subalpine fir/bedstraw, and subalpine fir and grand fir/beadlily.

Riparian zones (RIP) support mostly subalpine fir/bedstraw and beadlily.

Area not suited for timber production is identified by the following:

Grassland (NCGRAS) - Nonforested foothill and mountain grasslands, meadows, and shrubland.

Subalpine (NCSUBA) ~ Upper subalpine lands, often forested but with slow growth and not capable of producing industrial wood. Includes the subalpine fir/grouse whortleberry, subalpine fir/woodrush, whitebark pine/subalpine fir, and alpine larch/subalpine fir habitat types with soils that are shallow, highly fractured rock, 50 percent or more coarse fragments, and predominantly physical weathering.

Rockland and Water (NCNFWR) - Typically nonforest water, rockland, and talus. Also includes administrative sites and other poorly to moderately stocked forest lands at all elevations with shallow fragmental or stony and rocky soils and not capable of producing industrial wood.

Unsuitable (UNSUIT) - Available lands which are technologically unsuitable due to regeneration problems (Forest Plan Notes 85 and 86.) Mistletoe free regeneration cannot be assured.

Vegetative habitat types provide the basis for linking timber inventory and yield, wildlife and livestock forage production, water yield, and economic data to analysis areas. These criteria respond to water, timber and wildlife issues. Habitat types are biological potential units. Timber inventory data is tied to specific habitat type, however the limits of FORPLAN required aggregation of 22 habitat types suitable for timber production into the first four groups shown above.

#### 5. Land Type Criteria

Available and suitable timberland as further identified by the following land type and slope classes:

-40 - All land types on slopes less than 40 percent.

MN+40 - All moderate and nonsensitive soil land types on slopes 40 to 60 percent.

S40M60 - All sensitive soil land types on slopes from 40 to 60 percent and all moderate to nonsensitive soil land types on slopes over 60 percent.

SS+60 - All sensitive soil land types on slopes over 60 percent.

Unsuitable grassland and suitable riparian zones were identified by slope to separate suitable from unsuitable range:

-40 - NCGRAS and riparian zone on slopes less than 40 percent.

S40M60 - NCGRAS and riparian zone on slopes over 40 percent.

Unsuitable timberland (USNCNA) - Level 1 = NAVAIL and habitat type = NCNFWR, NCSUBA. and UNSUIT.

Land types and slope provided the basis for linking sediment coefficients, visual constraints, water, livestock forage, logging systems and roading to analysis areas. Economic data such as road costs per mile were also tied to land types. These criteria respond to the water, visual, timber and wildlife issues.

#### 6. Condition Class Criteria

All available and suitable timberland was identified as follows:

HRSAW2 - High risk sawtimber that is well stocked.

HRSAW7 - High risk sawtimber that is medium or poorly stocked.

IMSAW2 - Immature and mature sawtimber that is well stocked.

IMSAW7 - Immature and mature sawtimber that is medium or poorly stocked.

POL 2 - Immature and mature poletimber that is well stocked.

POL 7 - Immature and mature poletimber that is medium to poorly stocked in habitat types HT123 and riparian zone.

SAP - Seedlings and saplings.

NST - Nonstocked areas as determined by the backlog report and noncommercial moderate to poorly stocked pole stands.

USNCNA - Level 1 = NAVAIL and habitat type = NCGRAS, NCNFWR, NCSUBA and UNSUIT.

Condition classes identify existing timber conditions whereas habitat types or habitat type phases identify timber potentials. These criteria were used to identify cover/forage relationships, old growth, and forage production, as well as timber yield and economic value. They respond to the timber and wildlife issues. Condition, size and stocking classes were aggregated into the eight condition classes shown above in order to meet the limits of FORPLAN.

These analysis area criteria initially resulted in about 800 analysis areas which were aggregated to meet the requirements of FORPLAN as follows:

Cutover areas in the unroaded Level 2 were combined with their roaded counterparts. The only SAP and NST left in the unroaded Level 2 was that which exists in old wildfires.

All small analysis areas were combined with the most similar analysis area. The combination can be from one +40 land type to another, habitat type HT567 to HT123, and condition class IMSAW2 or IMSAW7 respectively.

Nonstocked areas were combined into two analysis areas per Level 1, Level 2, and Level 3.

Wherever possible, land type SS+60 was separated since these lands are not suited to roading.

The lodgepole habitat type ( $\mathrm{HT}^{l_{2}}$ ), condition class size, and stocking was kept as pure as possible since timber yields and economic values vary significantly by these criteria and most mountain pine beetle problems occur in this type.

Riparian zone acreage was maintained.

This aggregation resulted in the following:

	Analysıs Areas	Thousand Acres
Suitable lands		
D12W	107	68.32
FOREST	192	518.01
Total	299	<u>586.33</u>
Unsuitable lands		
D12W	1	.03
FOREST	1	<u>1.18</u>
Total	2	1.21*
Not capable		
D12W	4	43.30
FOREST	6	<u> 203.95</u>
Total	10	247.25*
Not available	1	743.08
Total	312	1577.88

<sup>\*33,324</sup> acres of land not capable were later reclassified as unsuitable, not restockable in 5 years.

The following special areas were included in the suitable and unsuitable timberlands; however, the acreage of each, by analysis area, was determined to facilitate adjustments in analysis area acreage and the distribution of outputs depending on their assignment:

Sapphire Montana Wilderness Study area
Blue Joint Montana Wilderness Study area
Research natural areas
Magruder road corridor
Developed recreation sites
Ranger Districts
Roadless areas

#### D. <u>Identification of Prescriptions</u>

#### 1. Overview

NFMA regulations define management prescriptions as "management practices and intensities selected and scheduled for application on a specific area to attain multiple-use and other goals and objectives" (36 CFR 219.3). Generally, a management prescription is a set of treatments or practices to develop and/or protect some combination of resources on a particular land type.

The interdisciplinary team reviewed the public issues and management concerns, used professional judgment and RPA assignments for guidance in developing multiple-use management prescription goal statements. These prescriptions are the basis for the management areas described in the Forest Plan.

The prescriptions determined necessary along with the goal statements and related issues are as follows:

#### a. Timber Prescription

The goal is to manage for the long-term growth and production of usable wood fiber, and it was selected to respond to the timber harvest level issue and RPA assignment by providing a high level of timber outputs.

#### b. Winter and Summer Range Prescriptions

The goal is to manage winter and summer range for big game. The big-game management part of the wildlife and fish issue prompted this goal. Application of this goal is also intended to determine if winter or summer range is the limiting factor. The Winter Range prescription was determined to be the limiting factor so the Summer Range prescription was eliminated.

#### c. Riparian Prescription

The goal is to manage riparian zones for aquatic and terrestrial animals; it was initiated by the wildlife and fish and water quality issues.

#### Partial Retention, Roaded, and Unroaded Retention Prescriptions

Goal statements for these three prescriptions are related to visual quality; wildlife and fish; and water quality, soil productivity and streamflow issues. They are: manage to maintain partial retention visual quality objective; manage to maintain roaded retention visual quality objective; and manage to maintain unroaded retention visual quality objective.

#### e. Semiprimitive, Primitive, and Wilderness Prescriptions

Three prescription goals were designed to respond to the undeveloped area assignment issue and the Blue Joint and Sapphire Montana Wilderness Study area issues. They are: manage to emphasize semiprimitive recreation opportunities; manage to emphasize primitive recreation opportunities; and manage existing wilderness.

#### f. Range Prescription

The goal is to emphasize domestic livestock grazing. It was developed to respond to RPA assignments and a management concern. Range is not a major issue.

#### g. Minimum Level Prescription

The goal is to minimize cost of management. This is a custodial prescription generally applied to lands not efficient to meet alternative objectives.

#### h. Developed Recreation Prescription

The goal is to manage developed recreation areas.

#### 1. Research Natural Area Prescription

The goal is to manage research natural areas, and is intended to meet research natural area targets assigned to the Forest.

#### 2. Design of Management Prescriptions

Management practices, standards and guidelines were then developed and assigned to each goal statement by interdisciplinary work groups. Practices were developed and assigned based on current research, feasibility, cost efficiency, potential for resource damage and ability to meet minimum management requirements. The management standards and guidelines needed to accomplish the goals of a prescription include the minimum management requirements, mitigation measures and resource coordination that are required by existing laws, regulations and policy.

Given the objective of the prescription, costs were estimated for resource elements to meet the standards or guidelines of the prescription. Costs of producing the outputs that would result from implementing the prescription were developed and compared to the benefit values produced. Prescriptions were carried forward if they were cost efficient in achieving prescription goals.

Two basic assumptions used in developing prescription costs were: costs experienced in implementing past practices were a reasonable basis from which to predict future costs; and the funding for production of outputs would include only the necessary funding.

Forest-wide standards and guidelines were developed to cover practices which are common to all prescriptions. The major Forest-wide standards and guidelines are for roading in riparian zones and for collector and local road construction.

The result was a set of thirteen multiple-use management prescriptions with a broad range of emphases, intensities, practices, standards and guidelines. Some of the prescriptions emphasize a specific resource such as the timber, wildlife, range, riparian, and visual prescriptions. Intensities of management vary within prescriptions increasing the range of choices available to the FORPLAN model. Other prescriptions serve a single purpose such as the research natural area prescription.

The management prescriptions were designed to:

Project the current program to evaluate implications

Explore resource potentials

Explore opportunities to improve efficiency

Explore opportunities to resolve issues and concerns

Explore opportunities to meet national targets (RPA)

Completed prescriptions were reviewed, discussed and revised as necessary by the management team, the interdisciplinary team and the core team. The review criteria included the following (Planning Records: Forest Plan Notes  $7^4$  and 79):

"Determine if all applicable practices have been included that are necessary to accomplish the prescription goal statement."

"Test the standards and guidelines for accuracy and completeness."

"If a piece of ground is assigned to this prescription, are these the things we would do to efficiently emphasize this resource?"

The Forest ran FORPLAN Objective function runs 9 and 10 which provide an analysis of the costs and benefits of different management prescriptions assigned to an Analysis Area. The calculations identified the timber prescriptions with greatest excess in discounted benefit to discounted costs. Refer to the planning records for more detail.

#### 3. Prescription Purpose, Criteria, and Assumptions

The timber, winter range, riparian, partial retention, roaded retention, unroaded retention, range and minimum level prescriptions are utilized in all FORPLAN runs. The semiprimitive, primitive, and wilderness prescriptions were in many FORPLAN runs but were eliminated from some to reduce the size of the model and were considered outside of FORPLAN. The developed recreation and research natural area prescriptions were used outside of the FORPLAN model. The thirteen prescriptions are described here.

#### a. Timber Prescription

#### (1) Purpose

Provide for cost efficiency of timber management. Recognize and provide for other resource uses which do not conflict including mineral exploration, winter range habitat management, domestic livestock grazing, maximum modification visual quality, and roaded natural recreation.

#### (2) Criteria and Assumptions

Available to all analysis areas tentatively identified as suitable for timber production.

This prescription provides for intensive timber management practices. The timber management intensities range from one regeneration entry (final harvest) to a precommercial thin, commercial thin, and a final harvest regime.

Even-aged silvicultural systems are provided including shelterwood in riparian zones and clearcutting in other areas.

The most efficient precommercial and commercial thinning intensities are available to all tentatively suitable timberland except land type SS+60.

The visual quality objective is maximum modification. Openings can be up to 40 acres in size on habitat types HT123, HT4, and HT567, and 5 acres in riparian zones. The amount of opening or unrecovered area allowed at one time on a land-scape is 45 percent on land type -40, 40 percent on MN+40, 29 percent on S40M60, and 25 percent on SS+60. The recovery period is 30 years to allow crop trees to reach 20 feet in height (Forest Plan Note 177).

Minimum rotation ages are provided, 95 percent of CMAI or 80 to 90 years. At least 5 percent of lands assigned to this prescription must be old growth.

Road density by land type will be maximized but shall not average more than 6.6 miles per section.

Logging systems provide for the least cost method by land type.

Livestock use will be less than 50 percent of annual forage production depending on habitat type.

Road density provides maximum potential for mineral exploration.

#### b. Winter Range Prescription

## (1) Purpose

Optimize elk habitat on winter range, follow Guides for Elk Habitat Objectives (USDA, 1978).

Allow for other resource uses that are compatible with winter elk habitat including timber management on suitable timberland, roaded natural recreation, modification visual quality and domestic grazing on suitable range.

## (2) Criteria and Assumptions

Available to all analysis areas suitable for elk winter range.

Perform elk habitat improvement projects in high-use areas.

Manage timber on tentatively suitable timberland to maintain 20 to 30 percent thermal cover.

At least 10 percent of lands assigned to this prescription must be old growth. Utilize even-aged silvicultural systems except on old-growth riparian zones.

Timber management intensities range from a final harvest only to precommercial thin, commercial thin, and final harvest intensity.

The visual quality objective is modification. Openings can be 40 acres on habitat types HT123, HT4, and HT567, and 5 acres in riparian zones. The amount of opening or unrecovered area allowed on a landscape is 40 percent on land type -40, 29 percent on MN+40, 20 percent on S40M60, and 17 percent on SS+60. The recovery period is 30 years.

Rotation age will average about 120 years.

Road density by land type can be maximized but shall not average more than 6.6 miles/section.

Logging systems provide for the least cost by method by land type.

Livestock use will be less than 35 percent of the annual forage production depending on habitat type (Forest Plan Note 106).

## c. Riparian Prescription

## (1) Purpose

Manage riparian zones for native wildlife and fish species. Resource uses compatible with riparian management are: timber management on suitable land, elk habitat management on riparian winter range, roaded natural recreation, partial retention visual quality, and livestock grazing on riparian livestock range.

#### (2) Criteria and Assumptions

All riparian zones suitable for timber management, about 60,000 acres, are assigned this prescription.

Nonstructural habitat improvement including seeding, planting, pruning and creating openings are appropriate.

Limit livestock use to less than 35 percent of annual forage production depending on habitat type.

Maintain 50 percent of suitable timberland in old growth on fisheries riparian areas.

Individual tree and group selection systems are the recommended timber intensities on fisheries riparian areas.

No intermediate harvests are prescribed.

The riparian prescription visual quality objective is partial retention. Openings cannot exceed 2 acres. The amount of opening or unrecovered area allowed on a landscape is 22 percent on land type -40 and 14 percent on S40M60. The recovery period is 30 years.

Mature trees will be harvested at about 180 years of age.

Road densities will be minimized.

Logging systems will protect soils.

#### d. Partial Retention, Roaded and Unroaded Retention Prescriptions

## (1) Purpose

Three prescriptions were developed to manage the visual resource: partial retention, roaded retention, and unroaded retention. Each prescription provides for compatible management of resources including timber management, range management, elk management on winter range, and roaded natural recreation. The unroaded retention prescription can also be semiprimitive recreation.

## (2) Criteria and Assumptions

The partial retention prescription is available to all tentatively suitable timberland except riparian zones.

The roaded retention prescription is available to all tentatively suitable timberland.

The unroaded retention prescription is available to all unroaded tentatively suitable timberland.

The shelterwood silvicultural system is prescribed for the HT123 and HT567 habitat types; clearcutting is prescribed for HT4 and selection in riparian zones.

Thinning is prescribed on portions of land types -40, MN+40 and S40M60.

The partial retention and both retention prescriptions are assigned the partial retention and retention visual quality objectives respectively. Partial retention openings can be 10 acres on habitat types HT123, HT4, and HT567. Retention openings can be up to 5 acres. The amount of unrecovered area allowed on partial retention and retention landscapes is 22 percent and 15 percent on land type -40, 18 percent and 13 percent on MN+40, 14 percent and 11 percent on S40M60, and 10 percent and 8 percent on SS+60. The recovery period is 30 years.

Rotation age will average about 180 years in the partial retention prescription and 240 years in the retention prescriptions.

Logging systems will be the least costly method by land type but cable systems will increase as road density decreases.

Old growth will be 10 to 25 percent in partial retention and 25 to 45 percent in retention.

Limit livestock use to 35 percent on winter range and 50 percent elsewhere depending on habitat type.

Road density will not exceed 5.5 miles per section in the partial retention prescription, 4.4 miles per section in the roaded retention, and no roads in unroaded retention.

## e. Range Prescription

#### (1) Purpose

Provide for a high level of domestic livestock grazing. Recognize and provide for other resource uses including timber management, mineral exploration, elk habitat management on winter range, roaded natural recreation and maximum modification visual quality.

## (2) Criteria and Assumptions

All analysis areas suitable for range management, about 140,000 acres, can be assigned this prescription.

This prescription provides for intensive timber management on suitable livestock range.

Regeneration is delayed 10 years to provide additional forage over the tree rotation.

Even-aged silvicultural systems are prescribed.

The most efficient thinning practices are provided for.

The range prescription visual quality objective is maximum modification with the same openings and recovery as the timber prescription.

Minimum rotation ages are provided, 95 percent of CMAI or 80 to 90 years.

Road density by land type can be maximized but shall not exceed 6.6 miles per section.

Logging systems assigned are the least costly method by land type.

Allow livestock grazing up to 50 percent the annual forage production depending on habitat type.

Road density provides for maximum potential mineral exploration.

### f. Minimum Level Prescription

# (1) Purpose

Provide a custodial management level for all lands. Manage lands only to protect life, health and safety of incidental users, prevent environmental damage to adjacent lands and prevent long-term degradation of resources.

## (2) Criteria and Assumptions

Assigned to all analysis areas.

Timber management only to protect adjacent lands.

Recreation management only to prevent resource degradation.

Close all roads not needed to protect adjacent lands.

Maintain existing livestock use.

# g. Semiprimitive, Primitive and Wilderness Prescriptions

## (1) Purpose

Three prescriptions were developed to manage undeveloped, roadless areas for semiprimitive recreation, primitive recreation and wilderness. They provide for the management of resources compatible with roadless recreation including wildlife habitat improvement and range management.

## (2) Criteria and Assumptions

All three prescriptions can be assigned to unclassified lands currently roadless; the wilderness prescription is also assigned to existing wilderness.

The semiprimitive prescription allows for sanitation-salvage harvest without roads to protect adjacent suitable timberlands. Any volume removed would be in addition to the allowable sale quantity.

# h. Developed Recreation Prescription

#### (1) Purpose

Provide developed recreation opportunities.

# (2) Criteria and Assumptions

Assigned to all existing and proposed developed recreation sites.

Provide for retention visual quality objective in and adjacent to developed sites.

Provide for expansion of the Lake Como, Larry Creek, and Lost Trail complexes.

Allow salvage harvest to protect users and facilities.

## 1. Research Natural Area Prescription

## (1) Purpose

Establish research natural areas to meet assigned targets.

# (2) Criteria and Assumptions

Assigned to all proposed research natural areas.

Locate areas to minimize conflicts with recreation, range, timber, and minerals.

# 4. References

Management prescription practices, standards, and guidelines are documented in Planning Record (1983a). Table B-2 compares the prescriptions to the standards and guidelines. The prescription intensity details are documented in Planning Record (1983b).

Table B-2 Prescription Comparisons

## E. Development of Timber Harvest Intensities

Timber management regimes were developed by considering the types of silvicultural practices that are feasible and sound for each group of vegetative habitat type for each condition class. The growth prognosis model (Wykoff and others, 1981) was utilized to predict timber yield for various silvicultural systems and intensities within each combination of habitat type and condition class. Costs and benefits were developed for practices and outputs associated with each regime.

Initially, regenerated and sapling yield tables were developed for the following regimes:

No thinning with shelterwood at ages 110 and 130 or with clearcutting ages 80 to 200.

Precommercial thinning at age 30 with shelterwood at ages 110 to 130 or clearcutting at ages 80 to 200.

Precommercial thinning at age 30 with commercial thinning at age 80 and shelterwood at ages 110 to 130 or clearcutting at ages 90 to 200.

Commercial thinning at ages 80 to 100 and shelterwood at ages 110 to 130 or clearcutting at ages 90 to 200.

Selection cutting with 20-year cycles starting at age 120, 180 and 240.

Existing pole stand yield tables were developed for the following regimes:

No thinning with shelterwood at ages 140 to 180 or clearcutting at ages 80 to 210.

Commercial thinning and overstory removal at age 70 with shelterwood at ages 140 to 180 or clearcutting at ages 80 to 120.

Selection cutting with 20-year cycles starting at ages 120 and 160.

Existing high-risk and mature-immature sawtimber yield tables were developed for the following regimes:

High-risk - shelterwood from present to 60 years from present and clearcut from present to 150 years from present.

Immature-mature - shelterwood 30 to 90 years from present and clearcut from present to 150 years from present.

Selection cutting with 20-year cycles starting at the present.

The shelterwood yield tables reflect final cut yields at 10, 20 and 30 years after the seed cut.

The next step was to analyze these practices and regimes both from a timber yield and economic standpoint to see if there were opportunities to eliminate intensities which did not contribute to an adequate range of timber and economic opportunities. The precommercial thinning-regeneration cut regime incurred the cost of thinning and resulted in less volume than the no thinning regime and was therefore eliminated from further consideration. The commercial thinning at age 100 was eliminated since there was no significant growth or economic advantage over thinning at 90 years. The shelterwood final cuts proposed 20 and 30 years after the seed cut were also deleted since silviculturally the overstory should be removed as soon as possible after regeneration is established.

The assignment of silvicultural regimes to analysis areas varies by slope and management prescription. Analysis areas which remain unroaded do not have thinning prescribed. Selection cutting is prescribed in riparian analysis areas since it is not biologically sound on most other suitable timberland. Shelterwood cutting is not prescribed in habitat type HT4 which is generally lodgepole pine.

Entry periods or rotation ages were expanded to reflect the requirements of each management prescription. For example, the partial retention prescription on land type MN+40 requires a rotation of about 165 years; therefore, the harvest entry periods in FORPLAN must allow trees to grow to this age.

Detailed analysis of assignment logic is found in Planning Record (1983b).

## F. Development of Resource Yield Tables and Coefficients

## 1. Overview

This section describes how the yields modeled in FORPLAN for each resource, road construction and sediment production were developed. Some yields were developed for analysis in FORPLAN and some were analyzed outside of FORPLAN.

## 2. Timber Yields

Yield tables for existing and regenerated analysis areas were developed from 1972-78 timber inventory data using the growth prognosis model (Wykoff and others, 1981). The timber inventory data was updated to 1980 prior to the growth projections. The growth prognosis model was modified to reflect Forest stocking capacities and to provide yields based on specific utilization standards.

The results of individual stand projections were summarized by habitat type and condition class using a program developed by Northern Region personnel. Each stand in a group was weighed by a factor based on the sampling procedure used in the timber inventory. The process resulted in yield tables based on more than one stand. These yield tables were adjusted by form and defect factors developed by destructive sampling gathered during the 1972 timber inventory.

The cubic foot yields shown in the Draft EIS used the Regional Guide utilization standards which are based on a minimum diameter breast height (dbh) of 6-inches for lodgepole pine and 7-inches for all other species. However, the board foot yields in the Draft were incorrectly based on Region One volume table standards which utilize an 8 1/2-inch minimum dbh. The board foot yield tables were revised based on Regional Guide standards and these tables were utilized to develop the yield information in the Final EIS. Cubic foot and board foot yield tables were also developed for current timber sale contract utilization standards, which use a minimum dbh of 7-inch for lodgepole pine and 8-inch for all other species. A comparison of green sawtimber volume by utilization standard and alternative for the first decade is shown below:

Utilizatıon			Altern	ative	(Green	Sawtı	mber_M	MBF)		
Standard	Ā	В	С	E	E1	E2	F	G	Н	J
			~							
Regional Guide	55	48	46	34	41	31	31	33	26	17
Current Contract	51	45	43	32	38	29	29	31	24	16
Forest Plan DEIS	49	43	41	31	37	28	3Ô	24	15	15

Timber yields vary by condition class, habitat type, silvicultural system, and time. First decade existing stand board foot/cubic foot volumes and regenerated yields at age 140 are shown in Table B-3 using Regional Guide standards.

Table B-3
First Decade Timber Yield

Condition Class	HT123	-MMBF/MMCF Per HT4	Acre HT567 & RIP
Existing tumber	<del></del>	<del></del>	<del></del>
Well-stocked high-risk sawtimber	11.51/2.76	8.38/1.85	16.73/3.89
high-risk sawtimber	10.44/2.23	12.88/2.91	10.06/2.35
sawtimber Moderately and poorly stocked	10.69/2.41	9.71/2.53	17.57/3.37
immature and mature sawtimber		7.31/1.73 12.79/2.82	5.91/1.34 12.79/2.82
Moderately and poorly stocked poletimber	8,21/1,82	NA*	NA*
Regenerated at age 140	.5.92/3.76	11.64/3.50	16.97/4.54

<sup>\*</sup>NA - Not Applicable

Shelterwood seed cut removal volumes range from 46 to 91 percent of the above volumes depending on habitat type and prescription. Selection harvests in riparian zones vary from 7 to 20 percent of the above volumes depending on prescription.

See Planning Records (1983b) for a detailed description of the timber yield table construction.

#### 3. Recreation Yields

Recreation visitor days by recreation opportunity spectrum, developed recreation, wilderness, habitat type and land type are in FORPLAN. However, these outputs have not been used in the analysis since recreation use is assumed to be more related to population trend than to land assignment. The recreation use analysis was completed outside of FORPLAN. The total recreation use projections were based on the Forest's proportional share of the use in Western Montana in 1979. The projections are documented in Planning Record: Forest Plan Notes 130 and 156. The proportion of total use in wilderness is based on the proportion of area in wilderness and roadless.

#### 4. Elk Yields

The yields analyzed in FORPLAN were elk forage production on winter and summer ranges. The purpose in analyzing both was to determine which limited elk population. The benchmark analysis indicated that forage production on National Forest winter range is the limiting factor; therefore, no additional analysis was conducted on summer range.

Winter range forage production was developed from the Wildlife Surveys Handbook (FSH 2609.21); Clipping Studies (USDA, nd), Production Coefficients and Economic Guidelines for Big Game and Livestock, (Reid, 1981) and yield tables from adjacent Forests (Forest Plan Note 101). Forage yields on winter range vary by prescription, slope and habitat type.

Forage production is converted to elk carrying capacity based on the following assumptions:

The winter use season is December 1 to May 1.

Vegetation is dormant during the season of use.

70 percent use by weight is acceptable when more than 30 percent of the use is during the dormant season.

Cattle are provided for but only within grazing allotments.

Forage production has been adjusted to reflect palatability, accessibility, slope, distribution of cover and area usable the entire 5-month period (Planning Record: Forest Plan Note 125).

An elk's forage requirement is 12 pounds/day or 360 pounds/month. Forage production is adjusted to reflect actual availability. About one-third is estimated to be available. Available forage divided by elk requirement for 5 months will predict winter elk population potential.

#### 5. Range Yields

The yield analyzed in FORPLAN was forage production on suitable livestock range. Range forage production was developed using procedures in Range Analysis Handbook (FSH 2209.21-R1); Clipping Studies (USDA, nd), Production Coefficients and Economic Guidelines for Big Game and Livestock (Reid, 1981); and yield tables developed by adjacent forests. Suitable rangeland occurs on land types -40 and MN+40 and habitat types HT123, HT567 and riparian zone within existing and closed allotments. No suitable range occurs outside of existing and closed allotments.

Forage production varies by habitat type and by prescription (Forest Plan Note 101). Forage availability varies by slope and forage assignment to other wildlife (Forest Plan Notes 101 and 142). Forage requirement is 720 pounds per animal unit month.

#### 6. Water Yield

The water yield analyzed in FORPLAN was acre-feet per decade for the entire Forest. The yields vary by precipitation zone, habitat type, land type and prescription including sivicultural system and intensity. Water yield is based on Garn, 1974.

## 7. Roads Yields

The FORPLAN road output is miles of collector and local road construction per decade during the planning period. Roads are modeled as built during the first entry of the existing timber stand. An additional 1-1/2 acres are assumed to be accessed for every acre harvested until the suitable timberland is completely accessed. Most roads are constructed by the 5th decade.

The coefficients vary by land type, existing road density and visual quality objective. No roads will be constructed to access land type SS+60 or in areas assigned to the unroaded retention prescription. Table B-4 displays the yields in miles/section assigned during first entry. The yields are assigned during the first commercial thin or selection entry if the prescription calls for commercial thinning or selection cuts, and are assigned during the regeneration cut if the prescription calls for clearcutting or shelterwood with no commercial thinning.

Table B-4
Road Construction by Land Type, Density, and Visual Quality Objective (miles/section)

Land Type	Existing Density	Unroaded Retention	Visual Roaded Retention	Partial	
-40	0.0 0.5 1.5 2.5 3.5	O NA NA NA	4.4 3.9 2.9 1.9 0.9	5.5 5.0 4.0 3.0 2.0	6.6 6.1 5.1 4.1 3.1
MN+40	0.0 0.5 1.5 2.5 3.5	O NA NA NA	2.2 1.7 0.7 NA NA	3.3 2.8 1.8 0.8 NA	6.6 6.1 5.1 4.1 3.1
s40M60	0.0 0.5 1.5 2.5 3.5	O NA NA NA NA	1.1 0.6 NA NA NA	2.2 1.7 0.7 NA NA	3.8 3.3 2.3 1.3 0.3
SS+60	0.0 0.5 1.5 2.5 3.5	O NA NA NA NA	1.1 0.6 NA NA NA	2.2 1.7 0.7 NA NA	3.8 3.3 2.3 1.3 0.3

NA = Not Applicable

# 8. Sediment Yields

Sediment yields were analyzed as follows. Sediment from new road construction was modeled in FORPLAN (RDSED). Yields vary by riparian and other habitat type, land type, management emphasis and intensity (Planning Record, 1983b).

The background sediment associated with existing roads and new roads built beyond the first 5 years of each decade were calculated outside of FORPLAN.

Sediment yields for natural baseline, logging, and site preparation (OTHSED) were modeled in FORPLAN. Yields vary by habitat type, land type, management emphasis and intensity.

The following shows how total sediment yield was determined (Forest Plan Note 153).

## a. Total Sediment

Natural base sediment + RDSED (New construction/-5 years) + OTHSED + RDSED sediment from constructed roads (past 5 years old) + sediment from existing roads divided by Forest square miles outside wilderness and RARE II W = tons/square mile/year.

RDSED = Millions of tons times factors to adjust trends of road construction divided by 10 = RDSED/year.

OTHSED = Millions of tons divided by 10 = OTHSED/year.

RDSED from constructed roads over 5 years old = total miles of roads constructed beginning with decade 1 that are over 5 years old  $\times$  6 (6 = tons of sediment/mile/year from roads 5+ years since construction). (Planning Record: Forest Plan Note 141.)

Sediment from existing roads = existing Forest road miles prior to decade 1 =  $2057 \times 6$  (6 = tons of sediment/mile/year from existing roads) = tons/year.

Forest area outside wilderness and RARE II W = 784,600 acres or 1226 square miles. This was the area modeled for sediment production.

#### b. Baseline Sediment

The natural base + sediment from 2,057 miles of existing roads including the sediment from roads under current contracts.

The baseline sediment yield plus the "total" sediment yield is the actual total sediment yield.

## c. Channel Routed Sediment

The sediment delivered to channels must be routed to a critical reach. This is accomplished by multiplying sediment yield by 0.8.

## 9. Fisheries

Fish yields are calculated in catchable trout outside of FORPLAN. The yields are based on population sampling, habitat inventories, and sediment that results from roads and timber harvest.

# IV. COST EFFICIENCY AND NET PUBLIC BENEFITS

This section describes cost-efficiency criteria and explains how net public benefits are derived. This analysis is required by National Forest Management Act regulations (36 CFR 219) and plays an important part in the development, comparison, and selection of Forest planning alternatives

## A. Net Public Benefits

Maximization of net public benefits is a goal of the Forest planning process. Net public benefit is the overall value to the Nation of all outputs and positive effects (benefits) less all the associated Forest inputs and negative effects (costs) of producing priced and nonpriced outputs from National Forest lands. Thus, net public benefits represent the sum of priced outputs (PNV) plus the net value of nonpriced outputs. Net public benefits cannot be expressed as a numeric quantity because PNV cannot be added to qualitatively valued nonpriced outputs. In addition, not all resource outputs have been assigned monetary values and costs.

# B. Present Net Value (PNV)

PNV represents the dollar difference between the discounted value of all priced outputs and all Forest costs over the 150-year planning period. Two discount rates, 4 percent and 7 1/8 percent were used to represent the real cost of money over time. Priced outputs include those outputs with market values (timber, range, forage, mineral leases, developed recreation, and special use permits) and those outputs with assigned nonmarket prices (dispersed recreation).

Each benchmark, except Benchmark M, and alternative was designed to achieve its goals and objectives in a manner that produces the greatest PNV. This was accomplished by solving FORPLAN with the objective function of maximizing PNV while meeting the specified constraints of the benchmark or alternative. The PNV calculated in FORPLAN was modified by including benefits and costs not modeled in FORPLAN. The modified values were used to evaluate the benchmarks and alternatives. The benefits and costs not included in FORPLAN were those which do not influence and are not significantly influenced by land assignment and output scheduling. This section describes how the prices and costs were calculated.

## 1. Priced Outputs Used in PNV

#### a. Discounting

Two discount rates representing the real cost of money over time were used to solve FORPLAN and to calculate the economic consequences of the benchmarks and alternatives. The 4 percent rate approximates the real return on long-range corporate investments, above the rate of inflation. (Row and others, 1981). It was the rate used to evaluate benchmarks and alternatives. The 7 1/8 percent rate, which is consistent with the 1980 RPA, was used to determine sensitivity of the proposed action to the 4 percent rate. Also, the PNV of all benchmarks and alternatives was recalculated at 7 1/8 percent for comparison. All costs and benefits were discounted from the midpoint of the planning period.

# b. Real Dollar Adjustments

Inflation was not included in the discount rates, benefits, and costs due to the difficulty of estimating future inflation rates and because inflation would equally affect both costs and prices. All prices and costs were expressed in first quarter 1978 dollars, consistent with the 1980 RPA. The Gross National Product (GNP) implicit price deflator index was used to inflate or deflate price and cost data to this common base (FSM 1971.32b).

## 2. Costs Used in PNV and Budget

All agency costs were estimated for the 150-year planning period for all benchmarks and alternatives. This section discusses how costs were developed, the major expenditure categories, funding source, and the actual costs by resource.

# a. Cost Development Process

Costs were developed by Forest personnel in conjunction with developing standards and guidelines for management prescriptions. The resource work groups estimated costs for every management activity by management prescription. The costs were based on historical data and professional judgment, and approximate the minimum funds needed to achieve the standards and guidelines in the management prescriptions. Cost data was used in developing feasible and cost-efficient prescriptions.

Costs dependent on land assignment and timber harvest schedule were modeled in FORPLAN by entering them in the economic tables. By solving FORPLAN to maximize PNV, the cost-efficient level of agency expenditures for each assignment was estimated for 150 years. Other costs which were not modeled in FORPLAN were developed by the planning team to meet the objectives of each benchmark and alternative. The actual cost data is discussed later in this section. More detailed information on data sources and FORPLAN modeling procedures is in the Forest planning records.

#### b. Cost Categories

Costs were stratified into three classes: fixed Forest Service costs, variable Forest Service costs, and cooperator costs (FSM 1971.52).

Fixed costs are the minimum expenditures necessary to meet legal requirements of ensuring public safety and environmental protection. These costs were defined by the minimum level benchmark and are \$3,300M/year for the first decade and \$3,100M/year for the remaining years. These costs do not vary by alternative and do not affect land management decisions. The costs include fixed ownership requirements, short-term maintenance of range allotments, timber sales under contract, Job Corps, and general administration.

Variable costs vary with the controlled output level specified in each benchmark or alternative. They include capital investments (the costs of creating or enhancing capital assets over time), planning and inventory, and operations costs (including annual costs of administration, management, and protection of existing resources and capital assets). Variable costs include the costs necessary to meet minimum management requirements which are in the standards and guidelines of planned activities and discussed in section VI.B. of Appendix B.

Agency cooperator costs were reflected in the output prices and were not directly treated as a cost. For example, timber stumpage prices reflect logging, brush disposal and milling costs of the purchaser.

In most cases, expenditures are appropriated through the normal federal budget procedures. Two exceptions are in-kind payments and special collections. Road construction and reconstruction which are performed by timber purchasers are deducted from timber receipts. Second, most of slash disposal, site preparation, and reforestation costs following timber harvest are financed through special collection brush disposal and Knudsen-Vandenburg funds.

#### c. Cost Increases

None of the basic unit costs are expected to increase above inflation over time. However, the average unit costs of many activities will increase through time as more expensive management activities are scheduled. For example, the average road construction cost increases in the first few decades as the more rugged land types are accessed.

## d. Cost Data by Resource

Costs are associated with each resource output for timber, range, recreation/wildlife, minerals, soil and water, Job Corps, and nonseparable costs. The nonseparable costs are not separated into resource, e.g., road maintenance, fire protection, and general administration.

Calculating present net value by individual resource may be misleading because the costs include expenditures required to produce, enhance, or mitigate more than one resource. For example, slash disposal costs may contain a cost to maintain visual quality. This cost appears in the timber category but the benefit is visual.

Costs for all management activities are displayed in Table B-5. The costs are grouped by resource program, and classified as Operational (0), Investment (I), or Planning and Inventory (P&I). Finally, whether or not the cost is modeled in FORPLAN is indicated.

Table B-5 Costs for Management Activities

Resource	Activity	Cost	Cost/Unit (1978 \$)	Calculated in FORPLAN
Timber		·	· · ·	
	Timber planning	P&I	108,500/Yr	No
	Slash disposal and site			
	preparation			
	Handpile and burn	I	120-270/Ac	Yes
	Machine scarification,			
	piling, and burning	I	135-215/Ac	Yes
	Broadcast burning	I	115-160/Ac	Yes
	Underburning	I	70/Ac	Yes
	Jackpot burning	I	40/Ac	Yes
	Handscalping	I	24/Ac	Yes

Table B-5 (continued)
Costs for Management Activities

Resource	Activity	Cost Category	Cost/Unit (1978 \$)	Calculated in FORPLAN
Timber			- <del></del>	
	Reforestation	I	143-158/Ac	Yes
	Planting		•	
	Replanting	I	154-191/Ac	Yes
	Backlog reforestation	I	189/Ac	Yes
	Reforestation exams	0	3/Ac	Yes
	Anımal control	I	4/Ac	Yes
	Mistletoe control	I	398-623/Ac	Yes
	Precommercial thinning and exam	I	75-153/Ac	Yes
	Sale preparation, exams, other			
	resource support	0	76-153/Ac	Yes
	Unregulated timber preparation	0	3/MBF	No
	Harvest administration	0	6/MBF	Yes
	Fuelwood administration	0	4600/Yr	No
	Genetic tree improvement	I	130/Ac	No
	Road construction and engineering	g I	28,000-49,000/Ma	Yes
	Road reconstruction and	-	•	
	engineering	I	12,200/M1	Yes
	Other resource monitoring	I	66,000/Yr	No
	Visual improvement projects	I	5900/Prj	No
	Soil inventory on suitable			
	timberland	P&I	0.35/Ac	No
	Soil and water improvement	I.	2600/Ac	No
	Land line location - current	0	3500/Mı	No
	Land line location - high	0	2700/Mı	No
	Right-of-way acquisition	I	1000/Mı	Yes
	Right-of-way cost share	I	7300/Yr	No
	Law enforcement	0	2700/Yr	No
Range				
J	Allotment planning	P&I	460/A1lt/Yr	No
	Allotment management - minimum	0	190/Allt/Yr	No
	Allotment management - moderate	0	440/Allt/Yr	No
	Allotment management - optimum	0	720/A1lt/Yr	No
	Fertilizing	I	12/Ac	Yes
	Seeding	I	23/Ac	No
	Rodent control	I	2/Ac	No
	Noxious weed control	I	137/Ac	No
	Fencing	I	3100/Mi	Yes
	Fence maintenance	0	14/M1/Yr	Yes
	Water development	I	1370/Dev	Yes
	Water development maintenance	0	9/Dev/Yr	Yes
	Soil and water improvement	I	2600/Ac	No
	Other resource support	I	1500/Yr	No
	Soil inventory in conflict areas	P&I	0.53/Ac	Yes

Table B-5 (continued)
Costs for Management Activities

Resource	Activity	Cost Category	Cost/Unit (1978 \$)	Calculated in FORPLAN
Minerals				
	Minerals management	0	69,300/Yr	No
	Geological inventory	P&I	480/Inv	No
	Suitability assessment Cultural inventory of roadless	P&I	560/Study	No
	areas	P&I	0.69/Ac	No
	Other resource support	I	5900/Yr	No
	Soil inventory of roadless areas	P&I	0.35/Ac	- No
	Soil and water improvement	I	2600/Ac	No
Human and		•	4 000 000 /7	
	Job Corps	0	1,900,000/Yr	No
	Senior community service employment program	0	16,100/Yr	No
Lands				
	Special use management, land	-	=0 000 /**	
	exchange	I	58,000/Yr	No
	Withdrawals	I	720/Yr	No
	Land line location	0	2700-3500/M1	No
	Land line maintenance	0	700-2400/M1	No
	RNA establishment	P&I	0.96/Ac	No
Facilities		_		
	Road maintenance - minimum	0	11/Mı	No
	Road maintenance - mcderate	0	160/Mi	Yes
	Administrative site construction		62,000/Yr	No
	Administrative site maintenance	0	70,000/Yr	No
	Dam inspection	0	700/Yr	No
Protection	Fire control - minimum	0	784,000/Yr	No
	Fire control - moderate	0	945,600/Yr	No
	Fire fuels management	I	160.78/Ac	No
		I		No
	Other resource support Insect and disease	I	1500/Yr 2000/Yr	No
	Insect and disease suppression	I	51/Ac	No
	Law enforcement	0	2652.95/Yr	No
Soıl & Wat	er			
	Water inventory	P&I	0.01/Ac	No
	Stream channel inventory	P&I	22/Mı	No
	Water uses management	0	1200/Yr	No
	Instream flow inventory	P&I	2700/Inv	No

Table B-5 (continued)
Costs for Management Activities

Resource	Activity	Cost Category	Cost/Unit (1978 \$)	Calculated in FORPLAN
Developed	Recreation			
	Management - minimum	0	1700/Yr	No
	Management - moderate	0	73,500/Yr	No
	Management - optimum	0	113,800/Yr	No
	Lake Como maintenance	0	1400/Yr	No
	Lake Como day area construction Lake Como Campground	I	221,100/Prj	No
	construction	I	260,100/Prj	No
	Larry Creek maintenance	0	1400/Yr	No
	Larry Creek construction	I	162,200/Prj	Νο
	Site rehabilitation	I	10,200/Yr	No
	Visual site design	P&I	2300/Yr	No
	Groundwater inventory	I	900/Yr	No
Dispersed	Recreation			
	Roaded management - minimum	0	0.01/Ac/Yr	No
	Roaded management	0	.0809/Ac/Yr	Yes
	Roadless management - minimum	0	0.01/Ac/Yr	No
	Roadless management	0	.0506/Ac/Yr	Yes
	Special use management	0	4100-4300/Yr	No
	RIM, travel plan, and maps	P&I	13300/Yr	No
	Backcountry planning	P&I	0.46/Ac	No
	Backcountry plan maintenance	P&I	0.02/Ac/Yr	No
	Cultural resource enhancement	0	3100/Yr	No
	Cultural overview	P&I	33,800/Prj	No
	Other resource support	I	1400/Yr	No
	Soil inventory - high use areas Law enforcement, search and	P&I	0.53/Ac	No
	Rescue	0	13300/Yr	No
Costs for	Management Activities			
	Trail maintenance - minimum	0	6/M1	$N_{O}$
	Trail maintenance	0	180-216/Mı	No
	Trail P&I - nonwilderness	P&I	4/M1/Yr	No
	Trail construction	I	22900/M1	ИО
	Handicapped trail construction	I	46000/M1	No
	Trail reconstruction	I	9200/M1	No
	Right-of-way acquisitions	I	3900/Case	No

Table B-5 (continued)
Costs for Management Activities

Resource	Activity	Cost Category	Cost/Unit (1978 \$)	Calculated in FORPLAN
Wilderness	3			
	Wilderness planning	P&I	0.40/Ac	No
	Wilderness plan maintenance	P&I	0.02/Ac	No
	Wild and scenic river plan		<b>0</b> = <b>0</b>	
	maintenance	P&I	808/Yr	No
	Wilderness management - minimum	0	0.01/Ac/Yr	No
	Wilderness management	0	.1017/Ac/Yr	Yes
	Existing wilderness boundary	0	9700/Prj	No
	MWSA area boundary	0	7000/Prj	No
	Other area boundary	0	3100/Prj	No
	Cultural inventory	P&I	0.69/Ac	Мо
	Other resource support	Ī	2200/Yr	No
	Soil inventory	I	0.07/Ac	No
	Search and rescue	0	2300/Yr	Мо
	Trail maintenance - minimum	0	6.25/M1/Ac	No
	Trail P&I	P&I	4.00/M1/Yr	No
	Trail maintenance	ō	180-216/Mi	No
	Trail construction	Ī	22900/M1	No
	Trail reconstruction	I	9200/M1	No
Wildlife 8	Fish			
	Nongame management	0	4100/Yr	No
	T&E surveys	0	18000/Srvy	No
	State cooperation	0	6600/Yr	No
	Access control - 60% habitat			
	effectiveness	0	0.09/Ac/Yr	Yes
	Access control - 40% habitat			
	effectiveness	0	0.04/Ac/Yr	Yes
	Nonstructural wildlife			
	ımprovement	I	140/Ac	No
	Structural wildlife improvement	I	900/Prj	No
	Nonstructural fish improvement	I	400/Ac	No
	Structural fish improvement	I	600/Prj	No
	Hatching channel assessment	I	3500/Prj	No
	Hatching channel maintenance	0	2400/Yr	No
	Water support	I	300/Yr	No

#### 3. Benefits Used In PNV

All priced benefits were estimated for the 150-year period for all benchmarks and alternatives. Priced outputs include those resources that are or could be exchanged in the marketplace including timber, range, recreation, minerals, and special uses. This section discusses the methods used to estimate current and future values.

The prices used in the analysis reflect onsite values for all resources, i.e., the value of the resource on the Forest. The values are consistent with cost estimates for activities which produce onsite resources. Benefits are classified as market values (timber, range, developed recreation, minerals) or non-market values (dispersed recreation). Furthermore, some of the benefits are actual receipts or in-kind payments to the government. The receipts serve as a base for 25-percent fund payments to State and local governments. Finally, some of the benefits are fixed. These benefits are associated with the minimum level benchmark and are the benefits associated with no active management.

#### a. Timber Benefits

The value assigned to timber reflects the onsite value of stumpage to the Forest Service. With the exception of sales currently under contract, stumpage is a variable benefit. The value is the difference between the lumber price and production costs of logging and milling. The price varies by species mix, median dbh, net volume per acre, and logging systems. The values are:

Tractor/Jammer : Y = -273.56 + .76 LPLT + 61.02 Lndbh + 4.61 VPASkyline : Y = -331.30 + .76 LPLT + 61.02 Lndbh + 4.61 VPA

Aerial : Y = -244.91 + .55 LPLT + 46.37 Lndbh

Where: Y = Bid value adjusted for BD collections (\$/MBF)

LPLT = weighted average lumber price, lumber tally (\$/MBF)

Lndbh = natural log of the median dbh
VPA = net volume (MBF) per acre harvested

The values were developed from data on 36 sales sold on the Forest between 1974 and 1980 for nonaerial systems, and 18 sales sold in the Northern Region between 1972 and 1979 for aerial systems. The stumpage prices were modeled in FORPLAN. Lumber prices (LPLT) and dbh vary by habitat type and condition class. Logging systems vary by habitat type, condition class, and management prescription.

Stumpage values represent both the benefit value to the taxpayer as well as the actual receipts to the US Treasury. All timber outputs from the forest are expected to be consumed.

Projections of real increases in stumpage prices were made for the 1980 RPA program and are used in this analysis (Haynes and Adams, 1980). These projections are based, in turn, on separate projections of lumber prices and production costs (logging and manufacturing costs plus profit). Using the residual value formula, the relationship between these factors is:

SV = LP - PC where: SV = stumpage value/mbf

LP = lumber price log scale (end product value)

PC = production costs

An assumption of a 10 percent increase in milling efficiency (from 1980 to 2030) was built into the lumber price projections. The stumpage value formula used in FORPLAN is:

The following table shows these projections as applied to Regional average values (based on 1975 - 1984 data). The variables LPI and PCI represent the proportionate increase in value from the present for lumber prices and production costs, respectively.

1980 RPA
Lumber Price, Production Cost and Stumpage Value Projections (1978\$/MBF)

<u>Year</u>	Lumber Price	<u>LPI</u>	Production Costs	PCI	Stumpage Price
1980	308.98	1.000	243.73	1.000	65.25
1985	353.78	1.145	272.49	1.118	81.29
1995	440.30	1.425	332.69	1.365	107.61
2005	510.74	1.653	367.79	1.509	142.95
2015	575.63	1.863	377.05	1.547	198.58
2025	640.52	2.073	385.34	1.581	255.18
2030+	676.05	2.188	388.75	1.595	287.30

The demand curve for timber was assumed to be horizontal; therefore, no downward sloping demand curve was used in the FORPLAN computer model. None of the available techniques for developing Forest level demand functions have a strong enough theoretical basis. See Downward Sloping Demand Curves in Reid (1981). The sensitivity of the FORPLAN Model to timber values is discussed in detail in Section VIII.

## b. Range Benefits

The value assigned to range forage reflects potential dollar returns from the range resource to the taxpayers even though only part of the price is actually collected by the Forest. The price is the net value to the rancher above the cash costs for grazing on the Forest. The value on the Forest is \$13.74/animal unit month (AUM) (Gee, 1981). This price was expected to increase in the future as red meat consumption increases (FSM 1971, Region One, Interim Directive #6, 6/1/81). Future values in dollars per AUM are:

1985	\$13.74
1995	14.43
2005	16.35
2015	18.27
2025	20.61

Because all forage outputs from the Forest were expected to be used, all forage outputs were priced Receipts from the grazing program are fees paid by the permittee. The receipt value on the Forest is \$1.73/AUM which is an average value for 1977-82 adjusted for inflation.

The value of the range program associated with the minimum level benchmark is the value of the current program until allotments expire. The value in other benchmarks and alternatives was calculated by applying the appropriate prices to the livestock forage schedule in FORPLAN. The benefit value modeled in FORPLAN was the average for the first 5 decades. The price was adjusted outside FORPLAN to show the actual price increases by decade.

## c. Recreation/Wildlife Benefits

The value assigned to recreation reflects potential dollar returns from recreation to the taxpayers even though most dollar values are not actually collected by the Forest. The value is the difference between the total value of a recreation experience to the recreation user and the cost of participating. The prices vary by type of experience and were expected to increase in the future. The values for the Forest are displayed in Table B-6.

Table B-6
Current and Future Prices for Recreation (\$/recreation visitor day)

	1985	1995	2005	2015	2025+
Big-game hunting Other hunting Wildlife viewing Fishing Wilderness	21.00 24.00 29.00 15.75 8.00	22.05 25.20 30.45 15.75 8.00	24.99 28.56 34.51 17.96 9.12	27.93 31.92 83.57 19.37 9.84	31.50 36.00 43.50 22.05 11.20
Other dispersed and developed recreation	3.00	3.15	3.37	3.99	4.50

Source: 1980 RPA.

Recreation use was projected to increase on the Forest as the population in Western Montana increases. Since recreation capacity exceeds use projections, recreation use was valued. The only exception to this was elk hunting. The amount and value of elk hunting was based on the potential size of the elk herd on the Forest instead of the size of Western Montana's human population.

Receipts from developed recreation and special use programs consist of fees paid at campgrounds and fees paid for special uses. Fees are projected to continue at \$5,000/year, which was the average value for 1980-81.

The value of recreation, excluding elk hunting, was calculated outside FORPLAN. A constant level of dispersed and wilderness recreation use was expected for all benchmarks and alternatives except minimum level benchmark, even though the quality will vary. A constant level of developed recreation was used for all benchmarks and alternatives except minimum level, maximum PNV, timber, and range benchmarks. The value of elk hunting was calculated by applying the appropriate price to the elk forage schedule in FORPLAN. The benefit value in FORPLAN is an average for the first five decades and does not reflect suboptimal cover/forage ratios. The price was adjusted outside FORPLAN using the actual prices by decade and the elk forage with the actual cover/forage ratio.

## d. Minerals Benefits

Receipts from the mineral program are fees paid for mineral leases and royalties. The value is \$122,000/year in the first decade and \$73,000/year in later decades. The value is calculated outside FORPLAN, is associated with minimum level, is assumed to be constant for all benchmarks and alternatives is not affected by land management activities, and assumes a moderate level of mineral activity.

#### e. Water Benefits

A value was not assigned to water quantity because any increases in water yield caused by management activities will occur during peak runoff when water quantity already exceeds the existing storage capacity. Changes in water quality are valued subjectively as a nonpriced benefit or cost (See section III.c.2(d)).

## 4. Values by Analysis Area and Prescription Criteria

Management efficiency, especially timber management, varies for specific areas of the Forest depending on the occurrence or application of the following:

Steepness of slope and soil sensitivity which are represented by aggregates of land types and slopes called land classes.

Potential vegetation represented by aggregates of habitat types called working groups which reflect tree species.

Management prescriptions which reflect the resources that will be emphasized and the intensity of management within a resource.

Timber condition class such as high risk sawtimber, poletimber, and saplings which reflect volume per acre and tree size.

Accessibility defined by existing road density and management objectives.

Decade the area is planned for harvest.

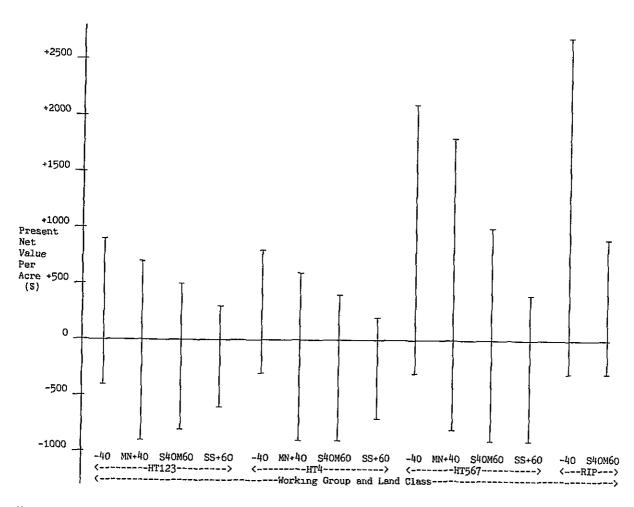
Figure B-1 shows how management efficiency, represented by the present net values per acre in FORPLAN, varies among working group/land class combinations. Working groups are aggregates of vegetative habitat types and represent areas with similar tree species and productivity. Land classes are aggregates of land types and slopes and represent areas with similar soil sensitivity, slopes, and productivity. Therefore, working group/land class combinations represent land classifications with similar biological and physical characteristics and similar economic characteristics.

Values by land class tend to decrease as slope and soil sensitivity increase from the gentle slopes of land class -40 to the sensitive soils and steep slopes of land class SS+60. The decrease in value is due to the additional cost of road construction and logging associated with steep slopes and sensitive soils. Land class -40 allows the highest density of roads but this is offset by the low construction cost per mile and the utilization of the least costly skidding method, tractor yarding. Land classes S40M60 and SS+60 require fewer but very costly roads and expensive yarding systems including skyline and helicopters.

The value ranges are fairly similar between working groups HT123 and HT4 which support mostly Douglas-fir, ponderosa pine, and lodgepole pine. The presence of ponderosa pine on some HT123 habitat types and existing roads causes the HT123 group values to be slightly higher than HT4. The value ranges increase substantially in HT567 and RIP where existing volumes per acre and growth are higher than HT123 and HT4.

Figure B-1 also shows the range of values within a working group/land class combination. The value range is determined by management prescription, timber condition class, access or roading, and timing of activities. The lower end of each range usually results from the application of costly timber management prescriptions, such as the unroaded retention prescription, to lands with low existing timber volumes per acre, poor timber growth, and no existing roads. The upper end of each range is usually represented by application of the timber prescription to lands with the highest timber volume per acre, good timber growth, and the highest density of existing roads.

Figure B-1
Range of Present Net Value Per Acre



Working Group = HT123 (Douglas-fir habitat types), HT4 (AF/Xete habitat type), HT567 (moist habitat types), and RIP (riparian habitat types)

Land Class = -40 (slopes less than 40%), MN+40 (moderately- and non-sensitive soils with 40 to 60% slopes), S40M60 (sensitive soils on 40 to 60% slopes and moderately- and non-sensitive soils on slopes over 60%), and SS+60 (sensitive soils on slopes over 60%)

Range of value  $= \overline{I}$ 

## C. Nonpriced Outputs

The most important nonpriced outputs in this analysis were the outputs identified by the six major issues: employment, visual quality, wildlife, fish, soil and water quality, roadless area assignment, and wilderness designation. Different levels of nonpriced outputs were produced in different alternatives by applying management prescriptions to specific areas and/or by applying output and inventory constraints. Any dollar costs associated with nonpriced outputs were included in PNV calculations.

This section summarizes major nonpriced outputs, who is affected by changes in output levels, what indicators were used to measure output changes, and how the changes in the output levels affect present net value. Nonpriced outputs, as issues, are discussed in Appendix A.

## 1. Employment

Job and income stability are the major nonpriced benefits of the timber harvest issue. In Ravalli and Missoula Counties in 1985, 9.7 percent of the labor force was employed directly in the forest products sector (U.S. Department of Commerce, Bureau of Economic Analysis, Unpublished Data from the University of Montana Bureau of Business and Ecomonic Analysis).

The forest products sector is largely dependent on the Forest for raw materials. Changes in the timber harvest program on the Forest will influence jobs, incomes, and lifestyles directly in the forest products industry as well as indirectly in all sectors. The alternatives were designed to explore the tradeoffs of providing different levels of job and income stability by providing a range of timber harvest levels. In general, as the level of timber harvest in the first decade increases, the PNV of the Forest decreases because less valuable timber stands on more costly lands are harvested.

Also, as the level of harvest is increased, the Net Public Benefit value of visual quality, recreation, wilderness, wildlife, fish, and water quality is usually decreased. Livestock and elk numbers increase with increased timber harvest.

The measurable indicators of stability in the forest products industry are employment and income in decade 1.

#### 2. Visual Quality

Visual quality is a major issue because nearly 40 percent of the nonwilderness area is visible from major travel corridors and populated areas. Changes in the visual quality of the Forest may affect the people who live in or visit the Bitterroot Valley as well as those who travel through the valley and Forest. The dollar value of visual quality to people who hike and drive in the Forest is included in the value assigned to recreation. However, these assigned prices do not reflect the total value of spectacular scenery on the Forest to the 22,500 people who live in the Bitterroot Valley, as well as the people who visit the valley.

The indicators of water quality are the amount of sediment in streams, the area of riparian old growth, and the number of catchable trout.

#### 5. Wildlife and Fish

A major issue on the Forest is how to manage fish and wildlife habitat. The monetary value of habitat is indirectly included in the value assigned to recreation associated with wildlife and fish. However, these prices do not account for the total recreational and ecological value of high levels of habitat. Recreation users including hunters, trappers, viewers, photographers, and those that want all species protected will benefit from high quality habitat.

The alternatives were designed to explore the tradeoffs of providing different levels of wildlife and fish habitat. The PNV of the Forest usually decreases when timber harvest is restricted to provide thermal cover, old growth, diversity, and riparian area protection. Diversity, elk security, and thermal cover generally decrease as timber harvest, road construction and livestock use increase; but increases with higher visual quality, more unroaded recreation, wilderness, and water quality.

The indicator is acres of old growth and diversity by habitat type including riparian; acres of elk security including habitat effectiveness and thermal cover; and sediment.

## V. SOCIAL AND ECONOMIC IMPACT ANALYSIS

#### A. Overview

Social and economic impact analysis estimates the relationship of Forest activities to people. Short-term impacts are of primary concern with consideration given to longer term effects (over 10 years) occurring within the impact area.

Forest-related economic impacts on employment, income, and state and local government revenues are directly related to the social well-being of people in the impact area. Additionally, the population's lifestyles, attitudes, beliefs, values, and social organization are linked to Forest management activities.

## B. Impact Analysis Area

The Forest's impact area is Ravalli and Missoula Counties in Montana. Ravalli County receives over 75 percent of the harvest volume, special use permits, mineral activity, and grazing permits. Missoula County is the trade center for western Montana and Bitterroot Valley residents. Table B-7 shows estimated resource flows for all Forest outputs.

Table B-7
Use of Forest Resources by County (percent of total use)

	Ravallı County	Mıssoula County		Lemhi County	Idaho County	Other Montana Counties	Other Countie	Total es
Forest area	69	1	0	0	30	0	0	100
Uncut volume under contract (1972-79)	89	11	1.	0	0	0	0	100
Special use permits (1980)	99	1	0	0	0	0	0	100
Dispersed recreation (1978)	38	21	2	2	10	11	15	100
Developed recreation (1978)	34	17	3	2	10	14	20	100
Wilderness and primitive area (1978)	34	21	2	2	9	11	21	100
Minerals (1980)	87	13	0	0	0	0	0	100
Outfitter permits (1980)	54	4	0	13	0	8	21	100
Grazing permits (1980)	95	5	0	0	0	0	0	100

## C. Economic Impact Model

An input-output model (IMPLAN) of Ravalli and Missoula Counties was used to estimate the employment and income impacts of Forest outputs and activities. Direct, indirect, induced, and total impacts were calculated.

Economic input-output (I-O) analysis is a procedure for describing the structural interdependencies of a regional economy or impact area and serves as a short-term predictive model for evaluating the impacts of changes in Forest outputs and activities.

I-O analysis is based upon the interdependence of production and consumption sectors in the impact area. Industries must purchase inputs from other industries, as well as primary sources like natural resources, for use in the production of outputs which are sold either to other industries or to final consumers.

Flows of industrial inputs can be traced via the I-O accounts to show linkage among the industries in the economy. These accounts are used to predict economic effects resulting from changes in Forest outputs and activities.

I-O analysis is based on assumptions that limit the accuracy of projections. Therefore, the predictions of economic impacts are relative indicators rather than absolute projections.

#### 1. IMPLAN Data Base

The I-O model data base consists of a national level technology matrix and a county-by-county file of estimated activity levels for total gross output, six components of final demand, three components of final payments and employment for 466 industrial/business sectors. See USDA (1983) for more information on the I-O model.

The national technology matrix is based on a 1972 Commerce Department I-O model converted to an industry-by-industry basis and updated to 1977 using the RAS procedure (Clopper and others, 1974). The county level information is based on a 1977 data set constructed by Engineering Economics Associates of Berkeley, California.

Utilizing the national technology matrix and the regional control totals for Ravalli and Missoula Counties, a data reduction method was used to develop a regional input-output table. The method uses the property of openness displayed by regional economies compared with the national economy (Richardson, 1972). Smaller regional economies exhibit much greater tendencies to be more open to import and export than the national economy. Based on the assumption that trade balances are the principle difference between national and regional purchase patterns, the supply-demand pool technique for data reduction was adopted (Schaffer and Chu, 1969).

#### 2. Final Demand Expenditures

The I-O model translates Forest outputs and activities into employment and income impacts. An intermediate step is the translation of outputs into final demand dollars. Final demand expenditures are different from the values used in the efficiency analysis. Final demand expenditures represent the dollars spent by the final consumers for the finished products derived from Forest outputs. For instance, timber is processed into lumber which has a sale value at the mill. The sale value represents the amount of new money that will be directly generated for the local impact area, assuming that most is sold outside the impact area, this causes the local impact. The efficiency analysis examines only stumpage or the market value of the raw material that leaves the Forest.

This modeling step is accomplished by applying a final demand expenditure per unit of output to total outputs and linking the resulting dollar amount to the sectors in which the direct expenditure takes place. This process determines the change that takes place in the existing economy caused by changes in Forest output levels. Expenditure information is contained in the planning records.

# D. Base Year Employment and Income Information

Forest outputs for 1980 were identified and analyzed with the I-O model to provide a base situation from which employment and income changes could be measured. Table B-8 contains 1980 output levels, employment and income amounts associated with 1980 outputs, and the response coefficients per unit of output.

Table B-8 Forest Outputs and Impacts in 1980

			Employment			Income		
	1980 Produc	tion	Direct Jobs	Total Jobs	Jobs/Unıt	Direct M\$	Total M\$	M\$/Unit
Softwood sawtimber	31.2	MBF	149	379	12.1/MMBF	3780	8340	\$270/MMBF
Picnicking	15.1	MRVD	5	8	.5/MRVD	60	120	\$ 8/MRVD
Camping	136.2	MRVD	12	19	.1/MRVD	150	190	\$ 2/MRVD
Skiing	6.1	MRVD	13	22	3.7/MRVD	130	300	\$ 49/MRVD
Water recreation Dispersed nonmotor-	34.9	MRVD	9	13	.4/MRVD	90	190	\$ 5/MRVD
ized recreation Dispersed motor-	124.9	MRVD	70	117	.9/MRVD	690	1580	\$ 13/MRVD
ized recreation	94.7	MRVD	55	91	1.0/MRVD	510	1800	\$ 13/MRVD
Big-game hunting	52.5	MRVD	42	70	1.3/MRVD	530	1050	\$ 20/MRVD
Small-game hunting	7.1	MRVD		4	.5/MRVD	30	60	\$ 8/MRVD
Nongame wildlife	4.2	MRVD	2	4	.8/MRVD	20	40	\$ 10/MRVD
Fishing	40.0	MRVD	10	15	.4/MRVD	100	210	\$ 5/MRVD
Livestock	14.2	MAUM	2	11	.7/MAUM	40	230	\$ 16/MAUM
Common minerals Forest operations maintenance and	0.0	MTON	0	0	.1/MTON	0	0	\$ 2/MTON
capital investment	2.7	MM\$	38	76	28.3/MM\$	730	1430	\$534/MM\$
Forest salaries	5.4	MM\$	114	205	37.8/MM\$	1990	3730	\$688/MM\$
Total			520	1050		8900	19100	

M - Thousand

MBF - Thousand Board Foot

#### E. Social Measures

Social impact analysis estimates how Forest policies and actions affect the quality of life in the local area. Future social conditions if current management continued were compared with the likely results of implementing other alternatives.

Social impacts were measured by social variables and social groups. In this analysis, social groups are limited to those affected by Forest Service activities, and social variables define how people are affected and the relationship between people and the natural environment.

AUM - Animal Unit Month

MM - Million

RVD - Recreation Visitor Day

A social assessment examined social group reactions to three Forest management alternatives (current direction, moderate amenity, and moderate commodity). The social variables and groups used in the assessment are described below. A short summary of findings is also presented.

## 1. Social Variables

#### a. Lifestyles

Lifestyles are the characteristic ways different segments of a population live. Some people use Forest resources to maintain a way of living that is financially dependent upon a particular resource-related occupation. Logging, log homes, recreational businesses, ranching, and guides and outfitters are examples. Without Forest resources, these people would have a difficult time maintaining their preferred lifestyle.

Another aspect of lifestyles is the more amenity-oriented activities in which people participate, such as hunting, fishing, backpacking, picnicking, berrypicking, and gathering wood. These activities are also dependent upon Forest resources, although the impact may be more subtle and less quantifiable than jobs or income. However, these activities are important to the lifestyle of many local, regional, and national people.

## b. Attitudes, Beliefs, and Values

Attitudes, beliefs, and values are reflected in people's likes, dislikes, perceptions, hopes, aspirations, and fears. Changes in Forest Service policy may result in practices that affect people's feelings about and understandings of the Forest.

First, this variable refers to the symbolic meaning people attach to the places and forest outputs. Although people may not be economically dependent upon the Forest, they may receive rational psychological benefit or symbolic meaning from resources.

A second component is a sense of freedom from control by others, such as outside or government interference. People often view the lack of local control over resource decisions as a problem. Local control over programs or proposals is often perceived as limited or nonexistent because policies come from the national level.

Third is self-sufficiency or the ability to live one's life in one's own way and use whatever resources are necessary to get along without any, or a minimum of, outside help. Certain quantities and qualities of Forest resources may be necessary for people to be independent.

Certainty and uncertainty, a fourth component, refers to the probability of living a desired way. It refers to the lack of confidence (uncertainty) or confidence (certainty) people may have about being able to stay in a community because of the changes in use of resources, or because the resources are in limited supply. Loggers, guides and outfitters, ranchers, and recreational businesses are often quite dependent upon the natural resources for their livelihood.

## c. Social Organization

Social organization is the way society and its subunits are structured. Major components considered here include community cohesion and stability.

Community cohesion is the degree of unity and cooperation among various segments of a community in realizing shared goals or solving problems. Changes in community cohesion can occur with an influx of people with different life philosophies. Issues can partition communities into factions and decrease community unification.

Community stability is the rate of change that people can accept without exceeding their capacity to deal with it. The rate of social change and the institutional structure of a community are key variables in the analysis of the effects of Forest Service actions.

Social stability and economic stability may not be the same, but both relate to community stability. Economic stability might be retained through full employment; but if there is a rapid change in the composition of the employment, social instability might result. Yet stability is not stagnation. Stable communities are usually going through relatively gradual and constant change and people adapt to new conditions.

# 2. Social Groups

The significance of the social variables change based on the communities and/or groups of people within communities. The communities or groups are people with common values and a way of relating to the Forest. The following describes groups within the Bitterroot Forest's impact area that were considered in the assessment.

# a. Ranchers/Farmers

The more traditional agricultural-based people who have the basic values (self reliant and conservative) generally associated with ranchers/farmers of the Intermountain West. This group also includes those who were once ranchers/farmers but are now retired.

## b. Loggers/Millworkers

People engaged in the wood products industry are known to be independent, commodity-oriented, and concerned over local control. This group includes those who were once loggers/millworkers, but are now retired.

#### c. Retired (Older)

The more traditional retirees who have retired on a pension and moved to the Bitterroot Valley because of climate or scenery including local retired residents who have an amenity orientation to resource management.

#### d. Professional

Doctors, lawyers, teachers, scientists, and government workers are included in this group.

## e. Newcomers (but not Older Retired)

This group includes those who have moved to the Bitterroot Valley because of the amenity and lifestyle values and younger retirees, back-to-nature people, and/or the whatever-we-have-to-do-to-stay-here group.

#### f. Business People

Business people who are involved in the more established, traditional, and "main street" business enterprises are often viewed as influential people who have strong community ties. Many are considered to be independent and conservative.

#### g. Regional Groups

People who live in Montana and north central and southeastern Idaho use/view the Forest from an amenity/recreational standpoint.

#### h. National Groups

People who have a direct or indirect interest in the management practices and/or outputs of the Forest land who are not in the local or regional zone of influence.

## 1. Minority and Civil Rights Groups

Nez Perce and Flathead/Kootenai Native Americans are concerned about and/or have ties to the Forest. The Nez Perce have grazing rights on segments of the Forest and the Flathead/Kootenai are native to the Bitterroot Valley and have areas of sacred/historical significance.

#### 3. Social Analysis Process

A questionnaire was developed to ascertain what changes, if any, would transpire if the Forest Plan alternatives were implemented. These changes, or social impacts, were estimated for each of the social groups. The questionnaire was completed by Forest Service personnel who were selected for their knowledge of local people and conditions. The completed questionnaires, social assessments from other Forests, interviews with area residents, and personal knowledge and expertise of the social scientist and interdisciplinary team were used to determine possible negative, neutral, or positive impacts for each social group. (see Planning Record: Social Assessment of the Present Situation, 1982).

#### 4. Findings

Different groups experienced contrasting and differential effects, depending upon the particular alternative. Generally, those who view or use the Forest from an amenity standpoint are positively impacted by amenity-oriented alternatives and negatively affected by commodity-oriented alternatives. Conversely, those who perceive or use the Forest from a commodity perspective tend to be positively affected by commodity-oriented alternatives and negatively affected by amenity-oriented alternatives. These findings tend to be true about many group members, but certainly not all of them.

Each local group viewed community cohesion/stability as being negatively impacted by both the amenity and commodity alternatives. Regardless of action, it was perceived that a certain amount of conflict and contention is inevitable. The area has had a history of conflict over amenity/commodity issues but many of the severe conflicts of the past have been reduced by a greater awareness of opposing points of view, more public involvement, better social awareness and subsequent resource management by the Forest. Any change from the current situation would likely create some concern over Forest management policies. This condition has been so and will likely remain so, as long as there are competing demands for limited resources.

#### VI. ANALYSIS PRIOR TO DEVELOPMENT OF ALTERNATIVES

## A. Introduction

The primary analysis prior to developing alternatives was the analysis of the management situation—a 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 broad range of reasonable alternatives by examining the following:

## Benchmark analyses

The minimum level of management.

The maximum physical and biological production potentials of resources as well as sets of resources.

The maximum present net value of resources with an established market value or an assigned value (a cost-efficiency measure).

A point of reference was also defined from which the costs and effects of constraints were measured.

Analysis of the current and expected future level of goods and services if current management direction continued.

Projections of demand for goods and services.

Analysis of the potential to resolve issues and concerns.

Analysis of the need to change management direction.

The results of this analysis form the framework within which alternatives were developed.

# B. Minimum Management Requirements (MMR)

The minimum management requirements in 36 CFR 219.27 are as follows:

Conserve soil and water resources.

Minimize hazards from flood, wind, wildfire, erosion, and other natural physical forces.

Reduce hazards from pest organisms.

Protect riparian zones.

Provide diversity.

Provide fish and wildlife habitat to maintain viable populations.

Adhere to multiple-use laws.

Protect threatened and endangered species habitat.

Provide for utility and transportation right-of-way and corridors.

Develop road construction standards.

Revegetate temporary roads.

Maintain air quality.

Reforestation.

Limit openings to 40 acres.

The methods used to meet these minimum management requirements included:

Developing standards and guidelines and appropriate practices for management prescriptions.

Assignment of management prescriptions and intensities to analysis areas in FORPLAN.

Applying access, scheduled output and inventory constraints to analysis areas or groups of analysis areas in FORPLAN.

#### 1. Conserve Soil and Water Resources

The mapping and spatial fitting of FORPLAN outputs, local experience, and research indicate that timber harvest timing, intensity, amount and location; logging system; road density; fuel treatment; and site preparation affect soil productivity and water quality.

### a. Timber Harvest Timing, Amount, and Location

Analysis of FORPLAN outputs and the spatial fitting of these outputs for unconstrained FORPLAN runs indicated that timber harvest activities were concentrated in or adjacent to riparian zones. For example, in Benchmark N, over one-third of the suitable riparian zone was harvested at the end of 20 years and nearly three-fourths was harvested by the end of 30 years. In addition, entire analysis areas were harvested in one decade. The first analysis areas harvested were often riparian analysis areas which created a situation where large parts, if not all of a major stream bottoms, were cutover at one time.

Soils and watersheds were assumed to be in a recovered condition when a vegetative cover has re-established sufficiently to protect the soil surface from erosive forces, and when live root biomass from shrubs, grasses, forbs, and new seedlings begin to replace conifer roots of harvested trees thus aiding in reinforcement of soils from mass failure (Forest Plan Note 129.)

The minimum time necessary for vegetative recovery was set at two decades. This included the average time needed for establishment of a 15-year-old stand plus the time required for site preparation and planting. The amount of area that can be unrecovered or cutover and meet the soil and water MMR was established for each combination of habitat type and land type. The amount of unrecovered area ranges from 25 to 40 percent as shown in Table B-9.

Table B-9
Amount of Area That Can be Cutover (percent unrecovered)

Land Type*		Habi	tat Type**-	
	HT 123		нт 567	Riparıan Zone
-40	40	40	35	30
MN+40	40	40	30	NA
S40M60 SS+60	25 25	30 30	25 25	25 NA

\*-40 = all land types occurring on slopes less than 40 percent.

MN+40 = moderately- to non-sensitive soils on slopes from 40 to 60 percent.

S40M60 = sensitive soils on slopes 40 to 60 percent and moderately- to

non-sensitive soils on slopes over 60 percent.

SS+60 = sensitive soils on slopes over 60 percent.

\*\*HT 123 = Douglas-fir climax habitat types.

HT 4 = subalpine fir/beargrass habitat type.

HT 567 = moist habitat types generally subalpine fir/menziesia.

Riparian Zone = riparian habitat type.

The above constraints do not prevent the harvest of entire analysis areas and thus large blocks hundreds of acres in size, including riparian analysis areas were harvested in one decade. Consequently, an access constraint was used to limit the amount of harvest within an analysis area within a decade. This constrained the amount of harvest in decade 1 to 50 percent in nonriparian zones and 30 percent in riparian zones.

### b. Timber Intensity

Experience has shown that intensive timber management practices on sensitive soils with slopes over 60 percent, land type SS+60, and clearcutting large blocks in riparian zones should be avoided to help protect soils and water quality.

Management prescription intensities which require thinnings were not available to land type SS+60. The clearcut silvicultural system was not available to riparian analysis areas; however, small openings can be prescribed in riparian zones through the shelterwood and group selection systems. Final determination of a silvicultural system will be by a certified silviculturist.

#### c. Logging System and Road Density

Analysis of existing road densities and past logging activities indicated that the amount of road per square mile and the type of logging system must be controlled by type of soil and steepness of slope in order to protect soil and water resources.

Management prescription standards and guidelines were developed which allowed road density to be maximized and provided for the most efficient logging system but must meet the soil and water MMR.

The maximum average road densities by land type are as follows:

Land Type	Miles/Section
-40	6.6
MN+40	6.6
S40M60	3.8
SS+60	0

No roads were proposed in land type SS+60; however, roads can cross some of these lands occasionally and still meet the soil and water MMR.

The type of logging system required also varied by land type but was constrained by the above road densities. The logging systems required to meet the soil and water MMR are shown in Table B-10.

Table B-10
Logging System by Land Type (percent)

Logging System	-40	MN+40	s40M60	SS+60
Tractor	86	26	10	1
Cable	9	66	27	1
Skyline	3	8	28	15
Aerial	2	0	35	83

Cable = less than 800 feet distance

Skyline = greater than 800 feet distance

Aerial = generally helicopter

# d. Fuel Treatment and Site Preparation

Heavy accumulations of logging slash after harvest may require treatment to reduce risk of loss from wildfire. Site preparation is often necessary to assure adequate reforestation. Research has shown that some fuel treatment and site preparation methods can reduce soil productivity and water quality.

Various treatments were considered in the development of management prescription standards and guidelines including broadcast burning; underburning including pulling slash away from live trees; jackpot burning; hand piling and burning; mechanical preparation and burning; and hand scalping. Depending upon the silvicultural method used, more than one method of treatment was assigned to habitat types and land types.

# e. Watershed Condition Improvements

This is a part of the watershed program to rehabilitate watershed damage due to unforeseen mishaps caused by management activities or due to natural occurrences. Management activities having the greatest effect are road construction, timber harvest and to some extent livestock use. The acreage needing treatment is based on average annual miles of roads constructed and area of timber harvested by alternatives (Forest Plan Note 136).

# 2. Minimize Hazards From Flood, Wind, Wildfire, Erosion, and Other Natural Physical Forces

The soil and water MMR discussed previously outlines the standards, guidelines, assignments, and constraints needed to minimize hazards from harvest fuels, flood, and erosion.

Wind can cause unnecessary damage to residual trees in timber sale areas if improper silvicultural systems are applied. This hazard is minimized by prescribing silviculturally sound systems by habitat type. In most cases more than one system was provided to assure proper field application.

Vast stands of sapling size lodgepole pine, such as those created following the Sleeping Child Fire, can develop into heavy fuel, high-risk, old-growth lodge-pole pine if left untended. The future heavy fuels and high risk can be reduced by controlling the stocking in some of these stands. Precommercial thinning is programed for 400 acres per year, mainly in the Sleeping Child Fire area.

# 3. Reduce Hazards From Pest Organisms

Trees on the Forest are susceptible to mountain pine beetle, spruce budworm, dwarf mistletoe, and other pest organisms. Rather than let the natural process create favorable conditions for these pests, several different management practices were considered.

For example, the clearcut silvicultural system was prescribed in all habitat types except riparian zones to help prevent the spread of diseases such as dwarf mistletoe in lodgepole pine and Douglas-fir.

Precommercial thinning was prescribed at the rate of 600 acres per year to reduce the risk of mountain pine beetle epidemics, control dwarf mistletoe, and minimize root rot and western spruce budworm damage.

The standards and guidelines provide for planting a species mixture where possible to prevent the creation of single species stands that favor insects and disease.

## 4. Protect Riparian Zones

Silvicultural system; timber harvest timing, intensity, amount, location, and size of unit; logging system, road density, and road design; and fuel treatment and site preparation can affect riparian habitat.

Timber harvest timing, intensity, amount, and location; logging system and road density; and fuel treatment and site preparation standards, guidelines, assignments, and constraints needed to meet this MMR are discussed under the soil and water MMR.

# a. Silvicultural Systems and Size of Unit

Clearcutting, shelterwood, sanitation, and individual tree selection harvest systems were available. Clearcutting was dropped from consideration because group selection cutting and shelterwood cutting provided the size of openings and trees for debris recruitment needed for riparian zones. Table B-11 shows the systems available in FORPLAN and size of opening in the benchmarks and alternative that provide for the riparian zone MMR under the appropriate management prescriptions.

Table B-11 Silvicultural Systems in Management Prescriptions

Prescription	Recommended Silvicultural System	Size of Opening
Minimum level	None or sanitation-salvage only to protect adjacent lands.	Dictated by value involved
Timber	Shelterwood and selection cut	<40 acres
Winter range	Shelterwood and selection cut	∠40 acres
Range (livestock)	Shelterwood and selection cut	≤40 acres
Riparian	Selection cut (Shelterwood on nonfisheries riparian)	≤2 acres
Roaded retention	Shelterwood and selection cut	<u>+</u> 7 acres
Unroaded retention	Shelterwood and selection cut enhance recreation opportunities and protect adjacent lands	<u>+</u> 7 acres
Developed recreation	Sanitation-salvage only to enhance recreation opportunities and protect adjacent lands	Dictated by recreation values
Semiprimitive recreation	Sanitation-salvage only to enhance recreation opportunities and protect adjacent lands	Dictated by recreation values

The shelterwood system consists of a regeneration cut and a final cut.

# b. Road Design

Roads constructed within the riparian zone can significantly affect water quality, stream channels, and fish habitat. The management prescriptions contain standards and guidelines for roading in riparian zones. The main objective is to utilize transportation system planning to minimize crossing streams and building roads parallel to streams in riparian zones.

## 5. Provide Diversity

Animal and vegetative diversity is high and well distributed on the Forest. Forty-seven percent of the Forest land area is classified wilderness. Management fires are provided for under all alternatives to meet the vegetative diversity MMR in wilderness.

About 43 percent of the 373 wildlife species living in the Forest use old-growth timber stands for nesting and feeding. Without old-growth forests, these species could disappear. Timber harvest activities primarily affect old growth. Currently, about 17 percent of wilderness is old growth and about 23 percent of the nonwilderness portion of the Forest is old growth. Analysis shows that self-sustaining populations of old-growth wildlife species can be provided with 5 percent of the forested area if well-distributed by habitat type-land type combinations. In order to average 5 percent at least 3 percent in nonriparian and about 25 percent in riparian areas should be maintained in old-growth. If the 5 percent minimum is not applied, then it results in something between 0 and 5 percent old growth in these habitat types. Habitat types HT567 and riparian zones would have no old growth left.

The 5 percent old-growth requirement is in several management prescriptions. Also, in order to prevent the harvesting of all old growth from the more productive sites, an inventory constraint was applied that required 5 percent of a habitat type remain old growth.

Old-growth designation does not necessarily mean no logging. Old-growth stands may be logged and regenerated when other stands have achieved old-growth status. Sanitation and salvage harvests may occur if the remaining trees meet old-growth criteria.

# 6. Provide Adequate Fish and Wildlife Habitat to Maintain Viable Populations

One or more selected indicator species are used to represent fish or wildlife species that have similar biological requirements. Selected species are impacted where timber, range, recreation, roads, and mineral activities are the emphasis in management direction.

The soil and water, diversity, and riparian zone MMR's provide for the MMR's of catchable trout and anadromous fish.

Three species—elk, pileated woodpecker, and pine marten—were selected as indicator species. Elk and other big game require habitat that has the right combination of feeding areas (forage) and areas to hide and rest in (forest cover). The constraints developed for the soil and water MMR, road density, fuel treatment, reforestation, limits on the amount of timber harvested within an analysis area, and the limit on the amount of openings in any one decade also provide for the elk MMR of cover/forage. (See Forest Plan Note 181.)

Pileated woodpecker and pine marten depend on old-growth timber habitat types for nesting and feeding areas. The old-growth requirement was previously discussed. Diversity provides the MMR's for pileated woodpecker and pine marten habitat, except for snags. The Forest-wide guidelines identify the need to retain all snags that are not a safety hazard to provide for cavity nesters and other species requiring the use of snags.

#### 7. Adhere to Multiple-Use Laws

The Secretary of Agriculture is directed to manage National Forests for multiple uses including outdoor recreation, range, timber, watershed, wildlife, fish, and minerals. The Secretary is also directed to develop and administer the renewable surface resources such as timber.

The Forest planning and environmental analysis process requires, as a minimum, that processes formerly used to make individual resource decisions be combined into integrated management decisions.

The riparian zone, diversity, fish and wildlife MMR's address how multiple use and sustained yield is achieved. The reforestation MMR provides for maintenance of a sustained yield of timber without impairment to the productivity of the land.

# 8. Protect Threatened and Endangered Species Habitat

The Grizzly Bear Recovery Plan (USDI, 1982) identified the Selway-Bitterroot Wilderness as grizzly bear ecosystem. The plan states that the ecosystem appears to have adequate space and suitable habitat to offer the potential for securing and restoring the grizzly bear.

Grizzly bear have occupied the area in the past. Human encounters would be the primary impact on grizzly bears. Wilderness classification precludes many of the management activities (timber harvest, road construction) that could adversely affect the bear and provides for grizzly bear habitat MMR. Wilderness management includes prescribed burning with unplanned ignition to help provide the natural ecological processes and offset past influences by suppressing fires.

The Selway-Bitterroot Wilderness also was described as an area which is ecologically suitable for gray wolf recovery (USDI, 1983). Wilderness classification and management provides for the gray wolf habitat MMR of den sites and provides for an adequate big-game prey base.

Suitable but unoccupied nesting habitat for peregrine falcons has been identified along the west side of the Bitterroot Valley. Cliff nesting sites will be unaltered by any planned activity and the MMR of retaining viable populations of all wildlife will provide an adequate prey base.

There is a possibility the bald eagle will nest or winter on two 40-acre parcels of National Forest land along the Bitterroot River. The two parcels are not scheduled for any management activity and will therefore be available for use by eagles.

# 9. Provide for Utility and Transportation Rights-of-Way and Corridors

Land-disturbing activities such as timber harvest, land clearing, road construction, pipeline trenches and holes for power poles occur when providing rights-of-way. An analysis outside FORPLAN and prescriptions defined the kinds of land which should be excluded or avoided in permitting or constructing linear corridor facilities. Avoidance areas are areas where establishment and use of corridors conflict with land use or management objectives such as cultural or historic sites, wilderness areas, research natural areas and scenic areas. Potential corridors and existing rights-of-ways were mapped and considered in the alternatives and benchmarks. Recently established and expanded wilderness areas (Selway-Bitterroot and Frank Church-River of No Return) preclude any consideration of a major east-west corridor on the Forest.

#### 10. Develop Road Construction Standards

Access roads are necessary for efficient timber harvest, but road construction affects the soil, water, visual, and riparian resources. Safe road conditions for public use are necessary. The variables considered to establish road standards were road density per square mile and road design requirements.

See soil and water MMR for the discussion on road density and the riparian zone MMR for the discussion of roading in riparian zones.

The adverse effects of a minimum standard road on sites with sensitive soils on slopes over 60 percent are not environmentally acceptable. Increasing the standard such as full bench construction versus cut and fill dramatically increases costs.

Minimum road designs considered the type of road, clearing width, width of road, and grades. Roads are categorized into two types--collector and local.

Clearing width was established at the top of the road cut and the toe of the road fill. No major difference in costs occurs between collector and local roads for clearing. Steeper slopes require larger clearing width and increased costs.

The width of local roads influences costs. The standard established was 12-foot width for rock surfaced roads and 14-foot width for unsurfaced roads. Narrower road widths were not considered because of logging equipment requirements and safety. The costs for this standard vary depending on the land (slope) type.

Major collector roads were established at a maximum 6 percent sustained grade with some pitches to 10 percent. This percentage was based on traffic volume, road maintenance costs, construction costs, and their effects on soil and water. Minor collectors and local road grades were established at a maximum 8 percent sustained normal width with pitches to 15 percent. Steep pitches were

considered exceptions. A grade up to 15 percent was used rather than 8 percent in those situations where less impact on soil, water, and visual resources was possible.

Mitigating measures will be applied to newly constructed roads and road maintenance to help maintain water quality and reduce damage to stream fisheries by limiting the amount of sediment that enters the streams. Some measures were applied to all roads while others were for specific sections such as within riparian zones or within sediment contributing areas adjacent to active channels. The sediment mitigating guidelines for roads are in the Forest planning records.

# 11. Revegetate Temporary Roads

Short temporary roads are sometimes needed to transport logs; however, they can affect soil and water resources. The road density for the Forest's transportation system and log skid distances were designed to preclude the use of temporary roads in most cases. The minimum requirement is to reestablish forage or grass cover by seeding. Revegetation was included in logging practices for prescriptions that harvest timber.

## 12. Maintain Air Quality

This requirement was handled outside of FORPLAN. The Regional Guide directs the Forest to work through cooperative agreements with the States to manage smoke emissions. Scheduling the time and number of prescribed burns is done outside the FORPLAN model and in cooperation with States of Montana and Idaho.

#### 13. Reforestation

In order to have reasonable assurance of regeneration in 5 years, seedlings are planted on most harvested areas. Planting occurs because of the long periods between cone crops, insect (spruce budworm) and disease (dwarf mistletoe) effects on seed sources and seedlings, grass competition or prevention of natural generation, and the need to close harvest openings within 20 years to meet the hydrologic recovery rate established in the soil and water MMR. Planting variables considered were: single species, species mix, stocking rates, and site preparation. The minimum requirement for species is a mix that minimizes plantation losses and the need to replant. Stocking rates are prescribed by silviculturists but are generally 200 to 600 trees per acre. The rate varies because the drier habitat types cannot support full stocking. Site preparation is required in most cases because native planted species cannot grow efficiently if existing vegetation competes for soil nutrients, water, and sunshine. Reforestation was included in the prescriptions with timber harvest as a management practice.

### 14. Limit Openings to 40 Acres

Clearcutting is a silvicultural system used on the Forest for even-aged timber harvest. The Regional Guide establishes that the openings created by even-aged silviculture normally will be 40 acres or less. Costs and practices were based on clearcuts of 40 acres or less and were included in the management prescriptions. As discussed in the soil and water MMR, the FORPLAN model harvested an entire analysis area in one decade. An access constraint which limited the

amount of harvest in an analysis area was applied to assure that cutting could be limited to 40 acres.

### C. Benchmarks

Fourteen benchmarks were developed to define the production potentials and economic relationships of the Forest. The efficient schedule of management activities, resource outputs, environmental effects, economic consequences, and land assignment to meet the purpose of each benchmark were estimated. This section describes the purpose of each benchmark. The major objectives and constraints are displayed in Table B-12 and Figure B-2.

Three types of benchmarks were developed:

Benchmarks that maximize present net value for the Forest and define the efficient levels of resource outputs.

Resource benchmarks define the maximum potential for timber production, range, elk, and wilderness.

The minimum level benchmark (Benchmark M) defines the minimum outputs associated with custodial management of the Forest and the unavoidable costs and benefits of public ownership.

The following procedures apply to all benchmarks:

Developed using FORPLAN.

Developed using an objective function of maximizing PNV except for Benchmark M which has an objective function of minimizing costs.

Not constrained by budget levels.

Comply with minimum management requirements and are legally implementable. The only exceptions were Benchmarks N and 0 which were used to examine tradeoffs of legal constraints.

Timber management constraints were used to preclude harvest from 743,100 acres of existing wilderness.

Regulated timber management was constrained to preclude it from all unsuitable timberland.

Timber harvest rotations were constrained to be greater or equal to 95 percent of the age at culmination of mean annual increment

A constraint was used so timber inventory in 150 years will equal or exceed the volume that would occur on a regulated Forest.

Several variations of the present net value and resource benchmarks determined the opportunity cost and resource tradeoffs of meeting specific constraints, objectives, regulations, and policies.

Table B-12 Benchmark Objectives and Constraints

Benchmark	Objective	Harvest Flow	Suitable Timberland (M acres)	Decade Harvest Floor	Minimum Ma Reguire Soil & Water	ment
К	Determine PNV of market and nonmarket values while meeting MMR's.	NDY	586 3	None	Yes	5%
Ĺ	Define maximum wilderness potential and economic tradeoffs using market and nonmarket values	NDY	371 8	None	Yes	5%
м	Identify fixed costs of public land- ownership and incidental outputs	None	571.0	None	Yes	No
n	Define PNV of market and nonmarket values with no constraints.	NDY	586 3	None	No	No
0	Determine PNV of market and nonmarket values while meeting minimum soil/water constraints.	NDY •	586 3	None	Yes	No
P	Define PNV of market and nonmarket values while meeting MMR's and departing from NDY.	Departure ( <u>+</u> 25%)	586.3	None	Yes	5 <b>%</b>
Q	Determine PNV of market values and meet MMR's	NDY	586 3	None	Yes	5%
Ř	Meet MMR's, harvest at least 137 MMCF in decade 1 and identify economic trade- offs using market and nonmarket values	NDY	586 3	137 MMCF	Yes	5%
S	Identify PNV of market and nonmarket values while meeting MMR's and providing moderate roadless recreation recreation	NDY	465.9	None	Yes	5%
T	Identify the livestock forage potential using range floor* and maximize PNV with market and nonmarket values	Departure ( <u>*</u> 10%)	574 3	None	No	No
J	Identify winter elk forage potential using winter range floor** and maximize PNV with market and nonmarket values	Departure ( <u>+</u> 10%)	574 3	None	Yes	5-10%
i	Identify PNV of market and non- market values while meeting MMR's assuming constant timber prices	NDY	576 1	None	Yes	5%
	Provide maximum timber output in decade 1 and identify economic tradeoffs using market and nonmarket values.	NDY	586 3	179 MMCF ***	Yes	5%
	Identify output and economic tradeoffs of current direction using market and nonmarket values	NDY	455 9 ****	71 MMCF	Yes	5-10%

<sup>\*</sup> Floor determined by FORPLAN run with an objective function to maximize range forage for 15 decades.

\*\* Floor determined by FORPLAN run with an objective function to maximize winter range forage for

<sup>15</sup> decades

\*\*\*
Timber floor determined by a FORPLAN run with an objective function to maximize first decade harvest.

\*\*\*
Timber floor is 95 percent of the maximum first decade harvest which was determined by a FORPLAN run with an objective function to maximize first decade harvest

# 1. Benchmark K (MAX PNV)

It maximized the net monetary value of priced market outputs (timber, range, developed recreation, and mineral leases) and nonmarket resources (dispersed, wilderness, and wildlife recreation). It established the "mix of resource uses, combined with a schedule of outputs that have an established market price or are assigned a monetary value" (CFR 219.12(e) and Forest Service Chief's letter (Peterson, 1983). This benchmark provided the basis for evaluating the economic tradeoffs of minimum management requirements and nondeclining yield. It also provided the basis for analyzing the sensitivity to nonmarket recreation values and to stumpage price increases, and for determining the opportunity cost of maximizing first decade timber harvest, wilderness designation, and minimizing management costs. Finally, it provided the basis for determining the opportunity cost of implementing alternatives.

#### 2. Benchmark L

It maximized wilderness management and defined the maximum wilderness designation. It was modeled like Benchmark K except timber management was excluded from all currently roadless areas, and wilderness management was optimized. The opportunity costs of maximizing wilderness designation and management were established by comparison with Benchmark K.

## 3. Benchmark M (MIN LVL)

It defined the minimum costs of public landownership and the resource outputs which are incidental to Forest Service land management decisions. It was modeled like Benchmark K except the objective function was to minimize costs.

#### 4. Benchmark N

It is the same as Benchmark K except constraints were not applied to meet minimum management requirements for soil, water, and old growth (Peterson, 1983). The opportunity cost of meeting the minimum soil and water constraints were established by comparison with Benchmark O.

## 5. Benchmark 0

This is the same as Benchmark K except constraints were not applied to meet minimum management requirements for old growth. The opportunity cost of meeting minimum old growth requirements was established by comparison with Benchmark K. The opportunity cost of meeting minimum soil and water constraints was established by comparison with Benchmark N.

# 6. Benchmark P

It is the same as Benchmark K except timber harvest was allowed to fluctuate 25 percent between decades. The economic tradeoffs of nondeclining flow were established by comparison with Benchmark K.

#### 7. Benchmark Q

It maximized the net monetary values of market resources. It defined "the mix of resource uses, combined with a schedule of outputs and costs, which will maximize the present net value of those major outputs that have an established market price" (CFR 219.12 (e)). It was modeled like Benchmark K except dispersed recreation was not assigned a monetary value in FORPLAN. The sensitivity of efficient land assignment and output schedule to dispersed recreation values was analyzed by comparison with Benchmark K.

### 8. Benchmark R

It defined the cost of providing a high level of timber harvest in the first decade. It is the same as Benchmark K except first decade harvest volume was constrained to be greater or equal to 137 MMCF (567 MMBF). The economic tradeoffs of maximizing first decade harvest were established by comparison with Benchmarks K and W. This benchmark also helped identify the tradeoffs of the timber harvest objectives of Alternative A.

### 9. Benchmark S

It defined the cost of providing a moderate amount of roadless area. It is the same as Benchmarks K and L except timber management is precluded from 122,700 acres of tentatively suitable timberland. The opportunity cost of providing 65 percent of the Forest as wilderness or roadless was established by comparison with Benchmark K. This benchmark also identified the tradeoffs of the roadless and wilderness designation in Alternative E.

#### 10. Benchmark T

The maximum livestock forage production was defined by a FORPLAN solution based on maximizing livestock forage production for 15 decades. Because this benchmark was established using a different set of assumptions about harvest flow and timber rotations, the economic results are comparable only to Benchmark U.

#### 11. Benchmark U

The maximum elk winter range forage production was defined by a FORPLAN solution based on maximizing elk winter range forage for 15 decades. The economic results are comparable only to Benchmark T because this benchmark was established using a different set of assumptions about harvest flow and timber rotations than the other 12 benchmarks.

## 12. Benchmark V

It defined the sensitivity of land assignment and output schedules to timber price increases. It is the same as Benchmark K except stumpage prices were assumed to be constant. The sensitivity of land management decisions to stumpage price increases were examined by comparison with Benchmark K.

# 13. Benchmark W

It maximized first decade timber harvest. It was modeled the same as Benchmarks K and R except the first decade volume was constrained to equal 179 MMCF (687 MMBF), which is the maximum harvest under nondeclining yield. The maximum harvest was defined by a FORPLAN solution based on maximizing timber volume for one decade. The opportunity cost of maximizing the first decade timber volume was determined by comparison with Benchmarks K and R.

# 14. Benchmark X

Defined "the current level of goods and services provided by the unit and the most likely amount of goods and services expected to be provided in the future if current management direction continues" (36 CFR 219.12 (e)). It was modeled by assigning management prescriptions from existing unit plans, and constraining the first decade timber harvest volume to be greater or equal to 95 percent of the maximum possible under the current land assignment. The opportunity cost of continuing current management with no budget constraints was defined by comparison with Benchmark K. This benchmark also helped examine the tradeoffs of the budget objectives of Alternative F.

# D. Comparison of Benchmarks

The monetary tradeoffs of the opportunities examined in analysis of the management situation were determined by comparing the benchmarks described in Section C. Monetary tradeoffs are limited to priced benefits and costs. In this section, the tradeoffs of minimum management requirements, nondeclining yield, and providing resource outputs are described. Second, the costs of implementing current direction and minimum level are discussed. Finally, the sensitivity of land assignment and output schedules to timber price trends and nonmarket resources values is discussed. Table B-13 shows selected outputs of the benchmarks, Table B-14 shows the land assignment of benchmarks, and Table B-15 shows the economic effects by resource group. Figure B-2 summarizes costs of the constraints.

Table B-13 Resource Outputs and Economic Effects by Benchmarks

Output	Unit of Measure		L	М	N	0	P	Senchma Q	ark R	S	T	U	<u>v</u> _	W	<u> x</u>
Roadless Area	M acre	133	0	400	133	133	133	133	133	283	150	150	358	133	242
Roaded Area	M acre	702	435	435	702	702	702	702	702	552	685	685	477	702	543
Additional Wilderness	M acre	0	400	0	0	0	0	0	0	0	0	0	0	0	50
Elk population Decade 1 Decade 5 Decade 10 15-decade average	M elk/ year	6.3 8.0 6.5 7.2	6.2 7 6 6 7 7.2	5 7 5 8 5 7 5.7	6.2 8.2 6.3 7.2	6 3 8.0 6 4 7 2	6.1 8.2 6.8 7.5	5.8 7.1 6.1 6.5	6 5 8 1 6 4 7.4	6.3 7.9 6.7 7.1	5.9 7 2 6 3 6 7	6.7 8 5 7.2 7.7	6.3 7.0 7.1 6.9	6.7 6 7 6 4 6.7	5.6 6.0 6.0
Livestock forage Decade 1 Decade 5 Decade 10 15-decade average	M AUM/ year	12 23 14 17	13 19 13 16	3 0 0 4	13 24 15 18	12 23 14 17	14 20 16 18	13 22 14 17	15 21 16 18	13 20 13 16	14 22 18 20	8 14 15 13	14 18 16 16	11 14 13 13	11 17 16 16
Suitable Timberland	M acres	586	369	0	586	586	583	583	572	450	558	527	398	561	451
Base harvest schedule Decade 1 Decade 5 Decade 10 15-decade average LTSY	MMBF/ year	15 71 66 61 63	13 44 41 39 40	8 0 0 <1 0	17 70 67 61 63	16 72 66 61 64	42 98 60 62 63	14 71 66 61 63	57 69 68 61 59	13 55 52 47 48	51 75 49 55 60	45 64 44 52 60	22 48 50 40 43	69 72 51 64 69	28 46 49 40 41
Road Construction Decade 1 Decade 3 Decade 5 Total	Miles/ year Miles	15 85 18 5320	13 43 10 3920	3 0 0 2087	16 77 18 5210	16 79 19 5310	46 65 23 5310	13 89 18 5310	13 65 13 5230	13 65 13 4390	45 115 5 2930	38 59 19 2660	24 26 71 4440	128 35 11 5120	37 38 10 3870
Local Forest-related employment Decade 1 Decade 2	Jobs	820 1540	810 1440	390 380	860 1810	850 1650	1260 1530	770 1480	1500 1620	790 1380	1360 1550	1300 1400	940 1040	1790 1790	1090 1200
Local Forest-related income Decade 1 Decade 2	MM\$	14 29	14 26	7 7	15 34	15 31	23 28	13 28	28 30	13 25	26 29	24 27	16 18	35 34	20 21
Benefits discounted at 4 %	MMS	414	347	61	429	420	428	411	424	362	403	390	323	381	294
Costs discounted at 4 %	MM\$	208	196	81	215	211	221	207	227	188	229	230	168	275	211
Present Net Value	MM\$	206	151	-20	214	209	207	204	197	174	174	160	155	106	83

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Table B-14
Proposed Land Uses by Management Emphasis for Benchmarks

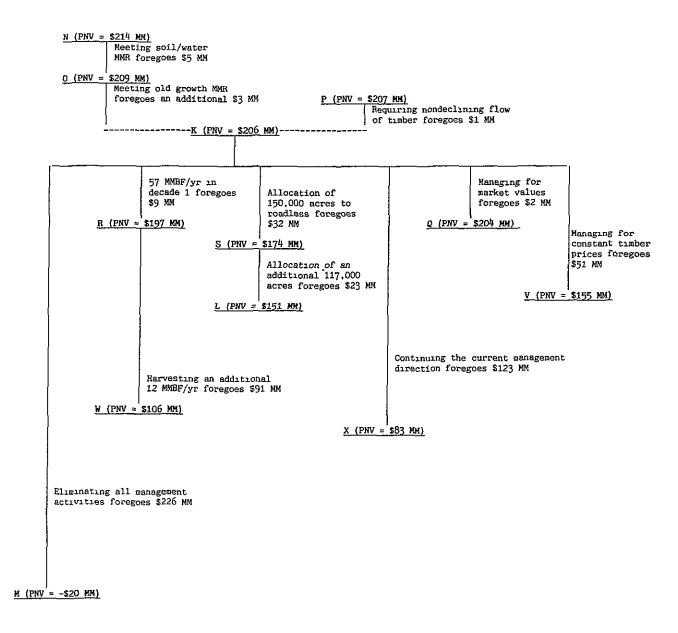
Bench- mark	Timber	Winter Range	Range	Manag	ement Emp Partial Reten- tion	hasis Roaded Reten- tion	Unroaded Reten- tion	Mın Level	Wilder- ness
K	417	204	5	0	0	0	0	209	743
L	220	177	13	0	0	0	0	25	1143
M	0	Ô	0	0	0	0	0	835	743
N	428	185	13	0	0	0	0	209	743
0	418	203	5	0	0	0	0	209	743
P	396	213	15	0	0	0	0	211	743
Q	490	81	13	0	0	0	0	251	743
R	416	183	13	0	0	0	0	223	743
S	309	172	9	0	0	0	0	345	743
${f T}$	311	153	135	0	0	0	0	236	743
U	296	243	28	0	0	0	0	268	743
V	198	219	21	0	0	0	0	397	743
W	314	286	2	0	0	0	0	233	743
X	180	81	105	4	35	48	39	293	793

Table B-15
Present Value Benefit and Costs for Resource Groups by Benchmark

Bench-	Present Net							Discounted		
mark	Value	Timber	Rec	Range	Other	Timber	Roads	Rec/Wld1	Range	Other
N O P K (MAX PNV) Q R S T U V L	214 209 207 206 204 197 174 160 155 151 106 83 -20	248 239 246 233 232 242 183 236 212 142 162 215 119 6	172 173 173 172 171 173 171 158 171 173 177 158 167 52	76766767466551	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	54 52 57 51 49 60 41 64 60 28 37 85 44	41 39 44 38 38 46 28 40 22 56 89	4 4 4 4 4 4 2 13 4 19 2 20 1	2 2 2 2 3 2 2 3 2 2 2 2 3 0	114 113 114 113 113 114 112 114 111 112 118 115 79

The discounted benefits of a resource group are not necessarily comparable to discounted costs because of joint production functions and nonseparable costs.

Figure B-2 Foregone Present Net Value of Major Benchmark Constraints



### 1. Range of Investment Opportunities

The range of investment opportunities was defined by Benchmarks K and M. Benchmark K maximized PNV when both market and nonmarket resources were assigned values and Benchmark M minimized costs. The minimum discounted cost of federal land-ownership is \$81MM, the discounted value of the outputs incidental to management is \$61MM and the PNV is -\$20MM. Benchmark K would require 2.6 times the minimum costs but would return 6.8 times the benefits. The PNV of any management alternative which meets legal obligations will fall between -\$20MM and \$205 MM.

## 2. Minimum Management Requirements

The tradeoffs of two minimum management requirements were analyzed by comparing Benchmarks K, N, and O. First, constraints were applied to disperse timber harvest among analysis areas and among land types to conserve soil and water resources (Benchmark O). Second, constraints were applied to provide at least 5 percent old growth on tentatively suitable timberland to provide diversity (Benchmark N).

The change in PNV results from limiting the amount of harvest in the most efficient analysis areas and land types primarily during the first 20 years. Shifting the harvest from the first two decades to later decades does not significantly change the total volume cost over 150 years, but the discounted value of the timber resource is decreased.

The soil and water constraint lowers the timber harvest in the first two decades by 13 percent which lowers the PNV of the Forest 2 percent. The old growth constraint lowers the timber harvest from the first 20 years an additional 9 percent which lowers the PNV of timber an additional 2 percent on the Forest. The shifts in timber harvest from the first two decades into later decades also cause slight reductions in transitory livestock forage but these changes are insignificant in terms of the total PNV of the Forest.

#### 3. Nondeclining Yield

The tradeoffs of nondeclining timber harvest yield were determined by comparing Benchmarks K and P. In Benchmark P, timber harvest flow could fluctuate up to 25 percent between decades; while in Benchmark K, timber harvest could not decline between decades. Nondeclining yield does not significantly effect PNV, but does significantly alter the efficient flow of timber, especially in the first few decades. Departing from nondeclining yield allows more volume to be cut in the fifth decade when discounted net timber values have peaked. However, more volume also must be harvested in the first decade when most discounted timber values are at their minimum because of the constraint allowing harvest to fluctuate up to 25 percent between decades. The gain in PNV by harvesting more in the fifth decade is almost offset by loss in PNV by harvesting more in the first decade. Departing from nondeclining yield allows 182 percent more volume to be efficiently cut in the first decade with a slight increase in PNV. The opportunity cost of nondeclining yield is \$2 MM (1 percent).

#### 4. First Decade Timber Harvest

The tradeoffs of varying timber harvest in the first decade under nondeclining yield are determined by comparing Benchmarks K, R, and W. The only difference between these benchmarks is the first decade timber harvest floor. Benchmark K has no floor, R has a floor of 137 MMCF (56.7 MMBF/year), and W has a floor of 179 MMCF (68.7 MMBF/year) which is the maximum volume of the Forest under non-declining yield.

The level of first decade timber harvest which maximizes the PNV of both market and nonmarket values under nondeclining yield (Benchmark K) is 15 MMBF/year. Increasing the first decade harvest from the economically efficient level of 15 MMBF/year to 57 MMBF/year costs \$9MM or \$19/MBF for the additional 420 MMBF harvested in the first decade. This cost is due to harvest volume shifting from the third to the first decade. Increasing first decade harvest from 57 MMBF/year (83 percent of maximum timber) to 69 MMBF reduced the PNV an additional \$91MM or \$760/MBF for the additional 120 MMBF harvest in the first decade. An estimate of the cost of first decade timber volume for the Preffered Alternative is presented in Section VIII. C. of Appendix B.

## 5. Roadless and Wilderness Management

The relationship between roadless and wilderness area management and present net value was defined by comparing Benchmarks K, S, and L. The only difference among these benchmarks is the amount of area precluded from timber management and the intensity of wilderness management. All tentatively suitable timberland was available for timber management in Benchmark K; while 79 and 63 percent of tentatively suitable timberland was available for timber management in Benchmarks S and L respectively. The intensity of wilderness management was minimal in Benchmarks K and S, and optimal in Benchmark L.

The level of roadless and wilderness area management which maximizes PNV of both market and nonmarket values is 880 M acres of which 743 M acres is in existing wilderness and 137 M acres is not capable for timber management. Increasing the amount of roadless and wilderness designation to 1,026 M acres was accomplished by precluding timber harvest on 122.7 M acres of tentatively suitable timberland. Precluding timber management from 21 percent of tentatively suitable timberland reduces the total volume harvested 23 percent over 150 years. The opportunity cost of increasing roadless area assignment from 880 M acres to 1,026 M acres is \$31 MM or \$210/additional roadless acre.

The maximum wilderness designation is 1143.2 M acres or 72 percent of the The tradeoffs of precluding timber management from 217 M acres of tentatively suitable timberland (37 percent of the tentatively suitable base) is to reduce the volume harvested 37 percent over 150 years. This reduction reduces the PNV of the timber program \$45 MM. Recreation benefits increase \$5 MM because dispersed use shifts to wilderness use. However since recreation costs increase \$14 MM to provide for optimal wilderness management, the PNV of the recreation program decreases \$9 MM. The total opportunity cost of maximizing wilderness designation and managing wilderness at an optimal level is \$54 MM (\$47/wilderness acre). The marginal cost of increasing the amount of roadless and wilderness from 1,026 M acres of 1,143 M acres is \$9 MM or \$80/acre of additional roadless or wilderness area. The additional cost of increasing wilderness management form the minimal to optimal level is \$14 MM or \$12/acre of wilderness.

# 6. Livestock Forage Production

Tradeoffs of maximizing livestock and elk forage were determined by comparing Benchmarks T and U. Forage outputs are maximized by harvesting timber on transitory range. The economic results are not comparable with the other benchmarks because these two benchmarks are established under a different of assumptions. The PNV is slightly increased by shifting from transitory elk winter range to transitory livestock range.

### 7. Current Direction

The economic tradeoffs of implementing Current Direction with no budget constraint was analyzed by comparing Benchmarks X and K. The opportunity cost of implementing Benchmark X is \$121 MM. The cost of \$15 MM in the recreation program mainly results from increasing costs for dispersed and wilderness management. Discounted timber management and road costs are \$16 MM less than Benchmark K because of a smaller timber management program. However, discounted stumpage values are \$113 MM less than Benchmark K because less volume is harvested, less valuable timber is cut, and more expensive logging systems are used. These economic effects are a consequence of meeting current roadless and wilderness area designation, visual quality objectives, and wildlife objectives.

# 8. Sensitivity to Dispersed Recreation Values

The sensitivity of land assignment and output schedules to assigned values for nonmarket resources was determined by comparing Benchmarks K and Q. The only difference between the benchmarks was the value of dispersed recreation. Dispersed, wilderness, and wildlife recreation were assigned monetary values in Benchmark K, but no monetary value in Benchmark Q.

In general, land designation and output schedules are not sensitive to recreation values. The PNV of market values in both benchmarks is \$48 MM. However, when dispersed recreation values are included, the PNV of Benchmark K is \$1 MM greater because of slightly more elk hunting. The analysis indicates that if the objective of the Forest were to maximize only timber and range net values, timber management would shift slightly from creating transitory elk forage to creating transitory livestock forage.

# 9. Sensitivity to Timber Price Increase

The sensitivity of land assignment and output schedules to real price increases for timber was determined by comparing Benchmarks K and V. The only difference between the benchmarks were future timber values. Timber prices were assumed to remain constant in Benchmark V. Timber prices were assumed to increase during the next 50 years in all other benchmarks and alternatives

One-third of the tentatively suitable timberland is economically suitable only if timber prices increase in the future. With constant stumpage prices, 50 percent more timber is harvested in the first decade but less is harvested in all other decades so that 40 percent less volume is efficient to harvest over 150 years. If timber prices do increase as modeled in Benchmark K, the PNV of Benchmark K is \$50 MM greater than Benchmark V.

However, if timber prices remain constant as modeled in Benchmark V, the PNV of Benchmark K is \$13 MM less than Benchmark V. The real price increase accounts for 70 percent of the PNV of Benchmark K and 52 percent of the PNV of Benchmark V.

## E. Resource Relationships

### 1. Timber Harvest/Roadless and Wilderness Designation

Timber harvest levels and roadless/wilderness designations are inversely related. The mix of resources which maximizes PNV when both market and nonmarket resources have been assigned values is the minimum amount of roadless/wilderness and 95 percent of the potential timber harvest. If only market resources are assigned values, the mix does not change significantly. As the roadless/wilderness area is increased above the minimum, the efficient level of harvest over 150 years decreases. When roadless/wilderness area is maximized, the efficient level of timber output is 60 percent of the potential.

# 2. Timber Harvest/Livestock Forage

Creating livestock forage with timber harvest could increase the livestock grazing potential 4,000 AUM to 20,000 AUM per a year depending on the decade. The mix of timber harvest and livestock forage which maximizes PNV when both market and nonmarket resources have been assigned values is 95 percent of the timber potential and 86 percent of livestock potential. Slightly more range is efficiently produced when values are only assigned to market resources.

# 3. Timber Harvest/Elk Forage

Creating elk forage with timber harvest could increase elk habitat potential from 5,700 to 7,000 elk. The mix of timber harvest and elk forage which maximizes PNV when both market and nonmarket resources have been assigned values is 95 percent of the timber harvest potential and 94 percent of the elk forage potential. When only market resources are assigned values, the efficient elk forage output drops to 84 percent of the potential. Maximizing timber outputs reduces the amount of efficient elk forage to 87 percent of the potential. Maximizing elk forage reduces the amount of efficient timber harvest to 81 percent of the potential.

## 4. Livestock Forage/Elk Forage

Both livestock forage and elk winter range forage are increased with timber harvest. However, both forage outputs cannot be maximized at the same time because of competition between livestock and elk. The mix which maximizes PNV when both market and nonmarket resources have been assigned values is 94 percent of the elk forage potential and 86 percent of the livestock forage potential. If only market values are assigned, then the efficient mix shifts from elk to livestock forage. Maximizing livestock forage reduces efficient elk forage to 87 percent of the potential. Maximizing elk forage reduces efficient livestock forage to 64 percent of the potential.

# 5. Livestock Forage/Roadless and Wilderness Designation

Producing high levels of roadless areas and livestock forage is not possible because roadless area designation precludes creating transitory forage with timber harvest. The mix which maximizes PNV when both market and nonmarket resources have been assigned values is the minimum amount of roadless and 86 percent of livestock forage.

When only market values are assigned the mix does not change significantly. When roadless area is maximized, the efficient level of range forage decreases to 80 percent of the potential.

# 6. Elk Forage/Roadless and Wilderness Designation

Elk forage production is not affected significantly by roadless area designation because most of the elk winter range is currently roaded.

# F. Production Potential

The benchmarks provide information about production and economic potential of the Forest. This section discussed the potential and efficient mix of resource outputs to meet the potential.

# 1. Economic Potential of Market and Nonmarket Values (Benchmark K)

The maximum PNV of the Forest with nondeclining yield and minimum management requirements is \$206 MM. Timber management is efficient on all tentatively suitable timberland except 3,000 nonstocked acres. However, PNV is maximized on much of the area by delaying harvest until discounted timber prices have peaked. Timber harvest starts at 15 MMBF/year in decade 1, but increases rapidly to 52-77 MMBF/year as prices increase. Seventy-one percent of the tentatively suitable timberland is assigned to the timber emphasis, 28 percent is assigned to the winter range emphasis, and one percent is assigned to the range emphasis. However, the winter range and range constraints have not been applied so all the land is actually managed under timber prescription constraints. A moderate level of elk and livestock forage is produced. Three-fourths of the area outside existing wilderness will be roaded. The remaining 133,000 acres of roadless areas are limited to not capable and technologically not suitable timberland.

# 2. Economic Potential of Market Resources (Benchmark Q)

The maximum PNV of the Forest when timber, livestock forage, and developed recreation are assigned monetary values under nondeclining yield and meeting minimum soil, water, and old growth requirements is \$204 MM. Timber management is efficient on all tentatively suitable timberland except 5,000 nonstocked acres. However, PNV is maximized on much of the area by delaying harvest until discounted timber prices have peaked. Timber harvest starts at 14 MMBF/year in decade 1, but increases to 56 MMBF/year in decade 2 and 72 MMBF/year in decade 3. Eighty-four percent of the suitable timberland is assigned to the timber emphasis, 14 percent to the winter range emphasis, and 2 percent to the range emphasis. A moderate level of elk and livestock is produced. Three-fourths of the area outside existing wilderness will be roaded. The remaining 133,000 acres of roadless areas are limited to not capable and technologically not suitable timberland.

## 3. Fixed Costs of Public Landownership (Benchmark M)

The minimum annual budget for the Forest is \$3.3 MM for the first decade and \$3.1 MM for later decades. The major activities included are:

Trapper Creek Job Corps would continue at the current level.

Fire suppression would be limited to preventing safety hazards and protecting adjacent landowners.

Timber harvest, road construction, and livestock grazing activities are limited to completing current contracts.

The present value of the costs is \$81 MM and the distribution is:

Job Corps59 percentFire25 percentOther9 percent

Minerals

Recreation trails

Range, timber, road contracts

Road maintenance

General administration 8 percent

Outputs which are incidental to management include timber and livestock grazing under contracts, recreation use, and elk forage. Recreation use would be restricted as trails, roads, and facilities are closed. Elk winter range forage potential would eventually decrease to 3,100 elk as transitory range was not created. The present value of these outputs is \$61 MM of which \$52 MM is recreation, \$1 MM is livestock grazing, \$6 MM is timber, and \$2 MM is mineral leases.

# 4. Timber Potential (Benchmark W)

The maximum first decade harvest under nondeclining yield is 18 MMCF/year (69 MMBF/year). This harvest level is sustained for the 150-year planning period. Timber management is efficient on 95 percent of the tentatively suitable timberland. The remaining 28,000 acres was assigned to minimum level emphasis to meet minimum old-growth requirements. Fifty-six percent of the suitable timber base is assigned to timber emphasis and 44 percent to winter range emphasis. Three-fourths of the area outside existing wilderness will be roaded. The remaining 220,000 acres are limited to not capable and technologically unsuitable timberlands and areas preserved for old growth. A low amount of livestock forages and elk winter forage is produced.

# 5. Wilderness Potential (Benchmark L)

The maximum wilderness designation is 1,143,000 acres of 72 percent of the Forest. The discounted cost of the optimal level of wilderness management is \$19 MM or \$17/acre of wilderness. The PNV is \$151 MM.

Timber harvest starts at 3 MMCF/year (13 MMBF/year) and is sustained at 11 MMCF/ year (35 to 47 MMBF/year) after the first decade. Timber management is efficient on all the tentatively suitable timberland in roaded areas. Sixty percent of the suitable timberland is assigned to the timber emphasis, 37 percent to winter range emphasis, and 3 percent to range emphasis.

6. Range Potential (Benchmark T)
-org be stressed grows britished bison recessingers of The maximum livestock forage converts to an average 27,000 AUM year. garijosi

Timber artest. (Worksmillioned) under Spanish Spanish Statistics are limited a completing current contracts

The maximum winter forage converts to habitat to support an average 7,700 elk/year. Projection of the elk/year.

Resource and Economic Fotential Under Current Management To dol , percent (Benchmark X) 9 percent

Continuing current management on the Forest with no budget constitution of the continuing current management on the forest with no budget constitution. for a moderate level of roadless, wilderness, livestocke for the els winter range forage. Timber harvest starts at 28 MMBFFJear for the Pirst three decades then increases to between 30 MMBF/year and 49 MMBF/year 13 Three-fourths of the tentatively suitable thinker and be seen as suitable for timber management. Of the 450,000 acres in the suitable timber Buse, 1400 Beferht is assigned the the things compasis; 1111 percent to the wanter nardsgif national it is the start of the sta created. The present value of these output Bay Franking TMA 70 NOTEAN MAILY recteation, \$1 MM is livestock grazing, \$6 MM is timber, and \$2 MM is "ineral leases.

## Overview

A Forest plan alternative is a mix of (Mariage Meneric Preserve Pr sevitoeldo bns lsog tnemeganam beriseb a evertas of anoitacol bns athuoma of ne navirus and sevitably and the sevitably sevitable of the 150-year planning period.

Where year the sevitable is sevitable for the 150-year planning period. -mit be within the maximum and hinimum resource potential or the present to proberred The reposer Frankfish for this estimation of the legister of the confidence o meet ainimum old-grouth requisionets. Fitty-six rescent of the suitable timber 212 Be Former ated facilitate analysis of opportunity costs, resource ase, and To some of the area outsing alternations of the area outsing a some outs

Be formulated to facilitate evaluation of present het value, benefits, and costs of achieving various outputs and nonpriced benefits.

Address and respond differently to major public issues, management concerns, and resource opportunities

Represent the most cost-efficient combination of management prescriptions to 2 + (AD) TY TO BIY meet the objectives of the alternative:

State the condition and uses that will result from long-term implementation.

State what goods and services will be produced, including timing and flow of outputs, and the costs and benefits generated.

State the resource management standards and guidelines.

State the purposes of the proposed management direction.

Formulation of alternatives, planning step five, followed the analysis of the management situation. Benchmarks from this analysis defined the range within which alternatives were developed. In addition, two alternatives were required: one which responds to the RPA program targets, and another which reflects current and future levels of goods and services if current management was continued (the no-action alternative).

Alternative goals and objectives were identified using expected use and demand for resources, supply potential (upper and lower limits), and public issues. The FORPLAN model was used to estimate the outputs and costs for each alternative by reflecting the objective of the alternative through a given set of constraints. Constraints applied to each alternative are discussed in detail in this section. Results of the FORPLAN analysis for each alternative were evaluated to assure conformance with laws, policies, and guidelines. Refinements were made to ensure that each alternative could be achieved.

A new alternative was developed between the draft and final EIS in response to fishery, timber efficiency and community stability concerns. It is identified as alternative E2 and described in subsection C.

### B. Common Constraints

The constraints applied to all alternatives resulted from NFMA regulations (36 CFR 219), administration policy (Peterson, 1983) and suitability criteria identified in Forest Plan Note 169.

1. Constraint: All alternatives except the departure E1 require that harvest flow is nondeclining (Multiple Use-Sustained Yield Act, 6/12/60).

Purpose: Provides for a sustained yield of wood products.

Rationale: Assumes a constant supply or upward trend in timber supply.

Tradeoff: Nondeclining yield affects PNV by limiting the harvest in decades 4-6 when net discounted stumpage values are maximized. (See Appendix B, section VI.D.(3) for further discussion.)

2. Constraint: Ensure an appropriate level of timber inventory at the end of the planning horizon (36 CFR Part 219.16).

Purpose: Assure that harvestable timber will be available in the decades immediately following the end of the planning horizon.

Rationale: Assume a future sustained yield of timber harvest.

Tradeoff: Ending inventory constraints could affect PNV by limiting the harvest in decades 4-6 when net discounted stumpage values are maximized.

3. Constraint: Limit amount of access to analysis areas and habitat type-land type combinations to meet soil and water minimum management requirements (see Appendix B, XI.B.(1)).

Purpose: Assure that soil productivity and water quality are maintained.

Rationale: Soil and water are basic resources and their loss would significantly reduce the soil productivity and therefore resource outputs.

Tradeoff: Access constraints for soil and water protection affect PNV by limiting the amount of timber harvest in the most efficient analysis areas during the first few decades.

4. Constraint: Precommercially thin 1,000 acres/year to minimize wild-fire and pest organism hazards (Forest Plan Note 171).

Purpose: Maintain healthy, vigorous stands at desirable stocking levels and composition.

Rationale: Precommercial thinning will help prevent dense stagnated lodgepole pine stands and provide for a species mixture.

Tradeoff: Precommercial thinning reduces PNV because the direct costs of \$75-\$150/acre in the first decade are not offset by increased yields until after 100 years.

5. Constraint: Riparian zones are protected by limiting timber harvest to about 10 percent of the suitable timberland base, the percentage of the suitable base that is riparian area; by restricting silvicultural system and size of unit; and road design (Planning Records, 1983a).

Purpose: Protect the areas that are most critical to a wide range of resources including timber, wildlife, fish, recreation, and water.

Rationale: Riparian ecosystems tend to be overcut in FORPLAN because of the high timber value unless constrained to protect other resources.

Tradeoff: Riparian zone protection reduces PNV by limiting the amount of harvest of the most valuable timber and increasing logging and timber management costs not allowing clearcutting and restricting the amount of road development.

6. Constraint: A minimum of 5 percent old growth is maintained on the suitable timber base by habitat type-land type combination (Planning Records, 1983a).

Purpose: Help maintain viable wildlife populations.

Rationale: Old growth will not be maintained on the more productive timber sites without a constraint.

Tradeoff: Old-growth retention reduces PNV by limiting the amount of timber harvest in the most efficient analysis areas (see Appendix B, section IV.D. for more discussion).

7. Constraint: Road densities and logging systems are limited by land type and management prescription (see Appendix B, XI.B.(1)).

Purpose: Protect soil and water and meet management prescription objectives.

Rationale: In order to protect soils, road density must be limited by soil sensitivity and slope. The density will be reduced to meet specific management prescription objectives.

Tradcoff: Limits on road density reduce PNV because more expensive logging systems and timber management activities are required.

8. Constraint: Maximize PNV but provide for at least 95 percent of the maximum timber harvest volume for the first decade while meeting all other resources objectives of each alternative (36 CFR 219 12(f)). Exceptions are alternatives E1 which is a departure for maximizing timber harvest in decade 1.

Purpose: Explore alternative levels of harvest volumes to address the timber issues.

Rationale: Timber harvest volumes will be low in the first decade in all alternatives unless a timber floor is applied.

Tradeoff: Requiring a high harvest level while meeting other resource objectives reduces PNV because less valuable timber is harvest early in the planning period (Appendix B, VI.D.(4)).

9. Constraint: Minimum rotation ages are set at the age where 95 percent of the CMAI timber volume occurs (36 CFR 219.16(a)).

Purpose: Assure that timber is harvested at or beyond its maximum mean annual growth rate.

Rationale: Provide rotation ages that maintain high productivity and meet Forest Service Manual direction (FSM 2413.2).

Tradeoff: Restricting rotation lengths to 95 percent of CMAI can reduce PNV because the minimum time for a return on investments is 80-90 years.

10. Constraint: The amount of commercial thinning/overstory removal is limited by volume.

Purpose: Commercial thinning/overstory removal varies drastically from one decade to another and in some cases drastically exceeds capabilities without a leveling constraint.

Rationale: The constraint limits this type of harvest to what would normally be available from access roads to regeneration harvests.

Tradeoff: Limiting the amount of commercial thinning reduces PNV because less efficient prescriptions are scheduled to meet the harvest volume requirement.

11. Constraint: Timber harvest is precluded from existing wilderness and the Magruder road corridor.

Purpose: Implement legislation.

Rationale: Wilderness legislation precludes timber management. The Central Idaho Wilderness Act provides for maintaining the current state of the road corridor between the Selway-Bitterroot and Frank Church-River of No Return Wildernesses.

Tradeoff: The economic effect of precluding timber management from wilderness and the Magruder road corridor has not been analyzed.

# C. Development of Alternatives

#### 1. Alternative A

The purpose of Alternative A is to maximize market outputs such as timber, livestock range, and minerals and meet the minimum requirements for nonmarket resources such as visual quality and recreation.

The criteria and assumptions underlying the development of this alternative are:

Maximize timber harvest on the tentatively suitable timber base, and meet the RPA timber target.

Meet RPA target for livestock animal unit months.

Opportunities for mineral and energy exploration will be optimized as the road system is completed.

Allow management activities to dominate the landscape.

Roadless recreation opportunities will be minimized and roaded opportunities maximized as the road system is completed.

There will be no research natural areas or developed recreation sites on tentatively suitable timberland.

The constraints utilized to meet the criteria and assumptions are as follows.

a. Constraint: Access for the timber harvest to each analysis area is limited, in the first three decades, to the percentage of land that can be unrecovered and meet the maximum modification visual quality objective.

Purpose: This access constraint assures that minimum acceptable visual quality is maintained, disperses timber harvest to help meet soil and water requirements, and provides a means to limit openings to 40 acres.

Rationale: Required to meet minimum visual quality policy requirements (USDA, 1977), 36 CFR 219.27 and The Northern Region Guide (USDA 1983)

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient analysis areas.

b. Constraint: Timber harvest area by habitat type-land type combination is constrained by an inventory and scheduled output constraint to meet visual quality objectives by management emphasis, soil and water requirements, and diversity requirements.

Purpose: Assure that these objectives and requirements are met on a Forest-wide and watershed basis.

Rationale: Required to meet 36 CFR 219.27, soil, water, and visual quality policy requirements.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient land types and timber condition classes.

c. Constraint: The range forage scheduled output is constrained to meet the RPA targets.

Purpose: Since most range is transitory, a constraint is required to assure that timber harvest quantity and timing on allotments will provide enough forage to meet RPA targets.

Rationale: Required by 36 CFR 219.12(f).

Tradeoff: Reduces PNV by shifting harvest in the early decades to less efficient transitory range.

#### 2. Alternative B

The purpose is to emphasize market outputs, maintain moderate visual quality along major road corridors, provide winter habitat to support elk population increases, and add to the wilderness base.

The criteria and assumptions underlying the development of this alternative are:

Emphasize timber production outside major road corridors.

Maintain or improve cover/forage relationships for elk on winter range.

Provide a high level of livestock forage.

Management activities will be visually subordinate to characteristic landscape patterns along main travel corridors. Elsewhere activities may dominate the landscape.

Provide road system for mineral, oil, and gas exploration.

The areas recommended for wilderness in RARE II remain recommended.

The constraints utilized to meet the criteria and assumptions are as follows;

a. Constraint: Access for timber harvest to each analysis area is limited, in the first three decades, to the percentage of land that can be unrecovered based on the visual quality associated with the acres assigned to each prescription.

Purpose: This constraint assures that the appropriate visual quality objective can be met for each prescription assigned to an analysis area and provides a means to limit openings to 40 acres.

Rationale: Constraint is required to meet requirements in 36 CFR 219.27 and alternative objectives

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient analysis areas.

b. Constraint: Timber harvest area by habitat type-land type combination is constrained by an inventory and scheduled output constraint to meet visual quality, soil, water, and diversity objectives by management emphasis.

Purpose: Assure that these objectives and requirements can be met on the Forest as a whole and on watersheds and subwatersheds.

Rationale: Required to meet 36 CFR 219.27(a)(1) and visual quality and diversity management objectives.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient land types and timber types.

c. Constraint: RARE II wilderness recommendations are assigned to wilderness utilizing prescription constraints.

Purpose: To meet the objectives of this alternative.

Tradeoff: Reduces PNV primarily because of foregone positive net timber values in decades 4-6.

d. Constraints: Sawmill and Boulder Research Natural Areas are removed from the suitable timber base with prescription constraints.

Purpose: To meet targets assigned in Regional Guide.

Tradeoff: The economic effect of precluding timber management from 488 acres of research natural areas has not been analyzed.

e. Constraint: Developed recreation sites are removed from the suitable timber base with prescription constraints.

Purpose: To meet the objectives of this alternative.

Tradeoff: The economic effect of precluding timber management from 461 acres of developed recreation sites has not been analyzed.

f. Constraint: The major travel corridors, including the Bitterroot mountain face, are assigned to the partial retention management prescription utilizing prescription constraints.

Purpose: Provide a moderate degree of visual protection to the most sensitive parts of the Forest.

Rationale: Required to meet the objectives of this alternative. Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas. In addition, the net timber values are lower in the partial retention prescription because the cost of more expensive logging systems and timber management activities are not offset by a cheaper road system.

g. Constraint: Winter range prescription is assigned to visually sensitive winter range adjacent to major travel corridors.

Purpose: Optimize elk winter range management on a portion of the suitable winter range and provide for modification visual quality management adjacent to major travel corridors.

Rationale: Required to meet the objectives of this alternative. Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas.

h. Constraint: Nonstocked, backlog analysis areas not designated unsuitable are reforested utilizing prescription constraints.

Purpose: FORPLAN will not program reforestation.

Rationale: Assure regeneration on lands cut to achieve timber production objectives as identified in 36 CFR 219.27(c)(3).

Tradeoff: Reduces PNV because returns on restocking costs are not realized for at least 90 years.

#### 3. Alternative C

The purpose is to maintain moderate visual quality along major road corridors, provide some roadless recreation and elk security, and recommend a moderate amount of wilderness with minimal impact on market outputs.

The criteria and assumptions underlying the development of this alternative are as follows:

Assign high-use roadless areas with little suitable timberland to roadless recreation and wilderness.

Protect visual quality along existing and potential road corridors

Emphasize timber production outside these road corridors.

Maintain or improve cover/forage relationships on elk winter range.

Maintain current livestock use.

Recommend for wilderness areas recommended in RARE II; the highest used portion of Blue Joint; Sapphire portion adjacent to existing wilderness; and parts of the Selway-Bitterroot roadless area, including areas in Little Rock, Lost Horse, Camas, Roaring Lion, Canyon, and Fred Burr Creeks and near St. Mary Peak.

The constraints utilized to meet the criteria and assumptions are as follows:

a. Constraint: Access for timber harvest to each analysis area is limited in the first three decades to the percentage of land that can be unrecovered based on the visual quality associated with the acres assigned to each prescription.

Purpose: This constraint assures that the appropriate visual quality objective can be met for each prescription assigned to an analysis area and provides a means to limit openings to 40 acres.

Rationale: Constraint is required to meet requirements in 36 CFR 219.27 and alternative objectives.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient analysis areas.

b. Constraint: Timber harvest area by habitat type-land type combination is constrained by an inventory and scheduled output constraint to meet visual quality objectives by management emphasis, soil and water requirements, and diversity requirements.

Purpose: Assure that these objectives and requirements are met on a Forest-wide and watershed basis.

Rationale: Required to meet 36 CFR 219.27, soil, water, and visual quality policy requirements.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient land types and timber types.

c. Constraint: The portions of analysis areas occurring in RARE II wilderness recommendations, and the other areas recommended for wilderness in Blue Joint, Sapphire, and Selway-Bitterroot roadless areas were assigned to the wilderness prescription using prescription constraints.

Purpose: To meet the objectives of this alternative and help provide a wide range of wilderness.

Tradeoff: Reduces PNV primarily because of foregone positive net timber values in decades 4-6.

d. Constraint: Small parts of Allan Mountain, Blue Joint, North Big Hole, Sapphire, Stony Mountain, and Selway-Bitterroot roadless areas are assigned to the semiprimitive recreation prescription.

Purpose: Helps meet the semiprimitive recreation and elk security objectives of this alternative.

Tradeoff: Reduces PNV primarily because of foregone positive net timber values in decades 4-6.

e. Constraint: Sawmill and Boulder Research Natural Areas are removed from the suitable timber base with prescription constraints.

Purpose: To meet targets assigned in Regional Guide.

Tradeoff: The economic effect of precluding timber management from 488 acres of research natural areas has not been analyzed.

f. Constraint: Developed recreation sites are removed from the suitable timber base with prescription constraints.

Purpose: To meet the objectives of this alternative

Tradeoff: The economic effect of precluding timber management from 461 acres of developed recreation sites has not been analyzed.

g. Constraint: The existing and proposed major travel corridors are assigned to the partial retention management prescription utilizing prescription constraints.

Purpose: Provide a moderate degree of visual protection to the most sensitive parts of the Forest.

Rationale: Required to meet the objectives of this alternative. Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas. In addition, the net timber values are lower in the partial retention prescription because the costs of more expensive logging systems and timber management activities are not offset by cheaper road systems.

h. Constraint: Winter range prescription is assigned to winter range that inventoried modification and partial retention visual quality objectives.

Purpose: Optimizes elk winter range management on a large part of the suitable winter range and provides for modification visual quality adjacent to major travel corridors.

Rationale: Required to meet the elk objectives.

Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas.

 Constraint: Nonstocked, backlog analysis areas not removed from the suitable timber base to meet alternative objectives are reforested utilizing prescription constraints.

Purpose: FORPLAN will not program reforestation.

Rationale: Assure regeneration on lands cut to achieve timber production objectives as identified in 36 CFR 219.17(c)(3).

Tradeoff: Reduces PNV because the returns on the restocking costs are not realized until 90 years later.

### 4. Alternative E

The purpose is to achieve substantial resolution of major issues and management concerns.

The criteria and assumptions underlying the development of this alternative are:

Emphasize a high level of visual quality adjacent to major existing road and trail corridors.

Provide semiprimitive recreation opportunities and elk security.

Recommend additions to the Selway-Bitterroot Wilderness (RARE II(W) lands). Recommend the upper part of Blue Joint Creek to wilderness.

Provide near optimal cover/forage ratios on elk winter range.

Manage riparian zones adjacent to fisheries primarily for recreation, wildlife, and fish.

Provide for regulated timber production on lands with moderate to high potential, to maintain current supply level, to meet Regional assignment, to achieve a proper species mixture, to provide for the orderly removal of lodgepole, to minimize aerial yarding, and to minimize large fluctuations in sediment production.

The constraints utilized to meet the criteria and assumptions are as follows:

a. Constraint: Access for timber harvest to each analysis area is limited in the first three decades to the percentages of land that can be unrecovered based on the visual quality associated with the acres assigned to each prescription.

Purpose: This constraint assures that the appropriate visual quality objective can be met for each prescription assigned to an analysis area and provides a means to limit openings to 40 acres.

Rationale: Constraint is required to meet requirements in 36 CFR 219.27 and alternative objectives.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient analysis areas.

b. Constraint: Timber harvest area by habitat type-land type combination is constrained by an inventory and scheduled output constraint to meet visual quality objectives by management emphasis, soil, water and diversity requirements.

Purpose: Assure that these objectives and requirements are met on a Forest-wide and watershed basis.

Rationale: Required to meet 36 CFR 219.27, soil, water, and visual quality policy requirements.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient land types and timber types.

c. Constraint: The RARE II(W) areas occurring in the Selway-Bitterroot roadless area and the upper part of Blue Joint Creek in the Blue Joint roadless area are assigned to wilderness utilizing prescription constraints.

Purpose: To meet the wilderness objectives of this alternative. Tradeoff: Reduces PNV primarily because of foregoing positive net timber values in decades 4-6.

d. Constraint: Large parts of the Allan Mountain, Blue Joint, Sapphire, Sleeping Child, Stony Mountain, Lolo Creek, and Selway-Bitterroot roadless areas are assigned to the semiprimitive recreation prescription.

Purpose: This assignment helps meet the roadless dispersed recreation and elk security needs identified in the alternative objectives.

Tradeoff: Reduces PNV primarily because of foregone positive net timber values in decades 4-6.

e. Constraint: Sawmill and Boulder Research Natural Areas are removed from the suitable timber base with prescription constraints.

Purpose: To meet targets assigned in Regional Guide

Tradeoff: The economic effect of precluding timber management from 488 acres of research natural areas has not been analyzed.

f. Constraint: Developed recreation sites are removed from the suitable timber base with prescription constraints.

Purpose: To meet the objectives of this alternative.

Tradeoff: The economic effect of precluding timber management from 461 acres of developed recreation sites has not been analyzed.

g. Constraint: Major road and trail corridors are assigned to the partial retention prescription except for a few access points on the west side of the valley which are assigned to the roaded retention prescription.

Purpose: Provide a moderate to high degree of visual protection to the most sensitive parts of the Forest.

Rationale: Required to meet the objectives of this alternative Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas. In addition, the net timber values are lower in the visual prescriptions because the costs of more expensive logging systems and timber management activities are not offset by cheaper road systems.

h. Constraint: The winter range prescription is assigned to winter range that occurs on areas with inventoried partial retention visual quality objective and on land types -40 and MN+40 that are inventoried as modification.

Purpose: Provide optimal cover/forage relationship on the most desirable habitat.

Rationale: Required to meet the objectives of this alternative. Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas.

1. Constraint: Unroaded analysis areas on habitat types HT123, HT567, and riparian zones on the visually sensitive west side of the Forest are assigned the unroaded retention prescription.

Purpose: The productivity and existing timber values on these sites are relatively high; therefore, these lands should be retained in the suitable timber base.

Rationale: The unroaded retention prescription protects visual quality and provides for regulated timber harvest.

Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas. In addition, net timber values are lower in the unroaded retention prescription because the costs are more expensive logging systems and timber management activities are not offset by cheaper road systems.

j. Constraint: Nonstocked, backlog analysis areas not removed from the suitable timber base to meet alternative objectives are reforested utilizing prescription constraints.

Purpose: FORPLAN will not program reforestation.

Rational: Assure regeneration on lands cut to achieve timber production objectives as identified in 36 CFR 219.27(c)(3).

Tradeoff: Reduces the PNV because the returns on the restocking costs are realized over 90 years later.

k. Constraint: Fisheries streams are assigned to the riparian prescription which utilizes uneven-age management.

Purpose: The riparian prescription is designed to protect fisheries and other wildlife habitat and provide for timber harvest. Rationale: These are the most productive timber sites and the most important sites for recreation and wildlife. The prescription provides for retaining riparian zones in the suitable base for both activities.

Tradeoff: Reduces PNV because the selection silvicultural prescription limits the timber harvest volume especially in decades 4-6 when net timber values are maximized.

1. Constraint: Selection cutting is forced starting in the first decade to assure a periodic flow of timber from fisheries streams.

Purpose: All selection cutting will be delayed by FLORPLAN to the fifth decade unless constrained to provide a periodic flow. Rationale: The objective of fisheries stream management is to provide for a low level but fairly constant flow of timber from these sites.

Tradeoff: Forcing selection harvest in the first decade instead of in decades 4-6 reduces PNV because timber harvest occurs before net timber values are maximized.

m. Constraint: Assure that part of the harvest in habitat type HT123 utilizes the shelterwood silvicultural system.

Purpose: The silviculturally sound method for some of the habitat types in this group is shelterwood; however, the model will assign the more efficient clearcut system unless constrained to do otherwise.

Tradeoff: Reduces PNV because clearcutting systems are cheaper.

#### 5. Alternative E1

The purpose of this alternative is to maximize timber outputs in the first decade and meet the objectives of Alternative E.

The criteria and assumptions underlying the development of this alternative are the same as Alternative E except for harvest flow.

The constraints of this alternative are the same as E except the harvest flow constraint is changed from nondeclining to a plus or minus 25 percent sequential bounds.

Purpose: To determine how timber can be produced in the first decade and meet the objectives of Alternative E.

Rationale: Departure procedure identified in 219.16(a)(3) and required in a letter to Regional Foresters (Peterson, 1983).

#### 6. Alternative E2

The purpose is to achieve substantial resolution of major issues and management concerns. It is a modification of alternative E but with a high resolution of water quality, fish, riparian, visual quality, and winter range issues.

The criteria and assumptions underlying the development of this alternative are:

Emphasize a high level of visual quality adjacent to major existing road and trail corridors, and fishing streams.

Provide semiprimitive recreation opportunities and elk security.

Recommend additions to the Selway-Bitterroot Wilderness (RARE II(W) lands). Recommend the upper part of Blue Joint Creek to wilderness.

Provide near optimal cover/forage ratios on elk winter range.

Manage riparian zones adjacent to fisheries primarily for recreation, wildlife, and fish, and nonfisheries to maintain debris dams and reduce risk to downstream fisheries.

Provide for regulated timber production on lands with moderate to high potential, achieve a proper species mixture, to provide for the orderly removal of lodgepole, and to minimize large fluctuation in sediment production.

The constraints utilized to meet the criteria and assumptions are as follows:

a. Constraint: Access for timber harvest to each analysis area is limited in the first three decades to the percentages of land that can be unrecovered based on the visual quality associated with the acres assigned to each prescription.

Purpose: This constraint assures that the appropriate visual quality objective can be met for each prescription assigned to an analysis area and provides a means to limit openings to 40 acres.

Rationale: Constraint is required to meet requirements in 36 CFR 219.27 and alternative objectives.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient analysis areas.

b. Constraint: Timber harvest area by habitat type-land type combination is constrained by an inventory and scheduled output constraint to meet visual quality objectives by management emphasis, soil, water and diversity requirements.

Purpose: Assure that these objectives and requirements are met on a Forest-wide and watershed basis.

Rationale: Required to meet 36 CFR 219.27, soil, water, and visual quality policy requirements.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient land types and timber types.

c. Constraint: The RARE II(W) areas occurring in the Selway-Bitterroot roadless area and the upper part of Blue Joint Creek in the Blue Joint roadless area are assigned to wilderness utilizing prescription constraints.

Purpose: To meet the wilderness objectives of this alternative. Tradeoff: Reduces PNV primarily because of foregoing positive net timber values in decades 4-6.

d. Constraint: Large parts of the Allan Mountain, Blue Joint, Sapphire, Sleeping Child, Stony Mountain, Lolo Creek, and Selway-Bitterroot roadless areas are assigned to the semiprimitive recreation prescription.

Purpose: This assignment helps meet the roadless dispersed recreation and elk security needs identified in the alternative objectives.

Tradeoff: Reduces PNV primarily because of foregone positive net timber values in decades 4-6.

- e. Constraint: Sawmill and Boulder Research Natural Areas are removed from suitable timber base with prescription constraints. Purpose: To meet targets assigned in Regional Guide.

  Tradeoff: The economic effect of precluding timber management from 488 acres of research natural areas has not been analyzed.
- f. Constraint: Developed recreation sites are removed from the suitable timber base with prescription constraints.

  Purpose: To meet the objectives of this alternative.

  Tradeoff: The economic effect of precluding timber management from 461 acres of developed recreation sites has not been

from 461 acres of developed recreation sites has not been analyzed.

g. Constraint: Major road and trail corridors are assigned to the partial retention prescription except for a few access points on the west side of the valley which are assigned to the roaded retention prescription.

Purpose: Provide a moderate to high degree of visual protection to the most sensitive parts of the Forest.

Rationale: Required to meet the objectives of this alternative Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas. In addition, the net timber values are lower in the visual prescriptions because the costs of more expensive logging systems and timber management activities are not offset by cheaper road systems.

h. Constraint: The winter range prescription is assigned to nearly all winter range that is not a partial retention visual quality objective.

Purpose: Provide optimal cover/forage relationship on winter range.

Rationale: Required to meet the objectives of this alternative. Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas.

1. Constraint: Fisheries and nonfisheries streams are assigned to the riparian prescription which utilizes uneven-age management and even-age management.

Purpose: The riparian prescription is designed to protect fisheries and other wildlife habitat and provide for timber harvest. Rationale: These are the most productive timber sites and the most important sites for recreation and wildlife. The prescription provides for retaining riparian zones in the suitable base for both activities.

Tradeoffs: Reduces PNV because the selection silvicultural prescription limits the timber harvest volume especially in decades 4-6 when net timber values are maximized.

j. Constraint: Selection cutting is forced starting in the first decade to assure a periodic flow of timber from fisheries streams.

Purpose: All selection cutting will be delayed by FLORPLAN to the fifth decade unless constrained to provide a periodic flow. Rationale: The objective of fisheries stream management is to provide for a low level but fairly constant flow of timber from these sites.

Tradeoff: Forcing selection harvest in the first decade instead of in decades 4-6 reduces PNV because timber harvest occurs before net timber values are maximized.

k. Constraint: Assure that part of the harvest in habitat type HT123 utilizes the shelterwood silvicultural system.

Purpose: The silviculturally sound method for some of the habitat types in this group is shelterwood; however, the model will assign the more efficient clearcut system unless constrained to do otherwise.

Tradeoff: Reduces PNV because clearcutting systems are cheaper.

1. Constraint: Constrain the cutover acres in out decades to assure that constraints a and b above are met.

Purpose: Assure that the timber output in decades 4 through 15 are meeting the objectives of the alternative.

Rationale: Access constraints were limited to 3 decades and inventory and scheduled output constraints to 9 decades.

Tradeoff: Reduces the timber supply in out decades and removes low value lands from the suitable timber base.

#### 7. Alternative F

The purpose of this alternative is to continue current management direction at past budget levels.

The criteria and assumptions underlying the development of this alternative are:

Maintain wilderness character in MWSA areas.

Emphasize visual quality along existing well-traveled road corridors.

Maintain elk habitat on winter ranges.

Manage existing open allotments for livestock.

Recommend RARE II(W) areas for wilderness.

The constraints utilized to meet the criteria and assumptions are as follows:

a. Constraint: Access for timber harvest to each analysis area is limited in the first three decades to the percentage of land that can be unrecovered based on the visual quality associated with the acres assigned to each prescription.

Purpose: Assures that the appropriate visual quality objective can be met for each prescription assigned to an analysis area and provides a means to limit openings to 40 acres.

Rationale: Required to meet requirements in 36 CFR 219.27 and alternative objectives.

b. Constraint: Timber harvest area by habitat type-land type combination is constrained by an inventory and scheduled output constraint to meet visual quality objectives by management emphasis, soil and water requirements, and diversity requirements.

Purpose: Assure that these objectives and requirements are met on a Forest-wide and watershed basis.

Rationale: Required to meet 36 CFR 219.27, soil, water, and visual quality policy requirements.

c. Constraint: RARE II wilderness recommendations are assigned to the wilderness prescription.

Purpose: These areas are recommended for wilderness in the unit plan management area descriptions.

Rationale: Required to meet current land management plan.

d. Constraint: Blue Joint and Sapphire roadless areas are assigned to the semiprimitive recreation prescription. Large parts of the Allen Mountain, North Big Hole, Stony Mountain, and Selway-Bitterroot roadless areas are also assigned to the semiprimitive prescription.

Purpose and Rationale: These areas are assigned to roadless recreation in the unit plan management area descriptions.

e. Constraint: Developed recreation sites are removed from the suitable timber base with prescription constraints.

Purpose: To meet the objectives of this alternative.

f. Constraint, Purpose, and Rationale: In order to duplicate the unit plan management area assignments, the following criteria were utilized (Table B-16).

Table B-16 Unit Plan Assignments

Timber Class (Unit Plans)	Inventoried VQO*	Roading Criteria	Other Criteria	Management Prescription
Special and marginal	R	Roaded	None	Roaded retention
Special and marginal	R	Unroaded	None	Unroaded retenti
Special and marginal	PR	Roaded	None	Roaded retention partial retentio and riparian
Special and marginal	PR	Unroaded	None	Unroaded retenti
Special and marginal	M, MM	Roaded	Winter range	Winter range
Special and marginal	M, MM	Roaded	Not winter range	Timber
Special and marginal	M, MM	Unroaded	None	Unroaded retentı
Standard	R, PR, M, MM	Roaded	Winter range	Winter range and timber
Standard	R, PR, M, MM	Unroaded Unroaded	Forest D12W	Timber Unroaded retenti

\*VQO: Visual Quality Objective

R: Retention

PR: Partial Retention

M: Modification

MM: Maximum Modification

Purpose: FORPLAN will not program reforestation.

Rationale: Assure regeneration on lands cut to achieve timber production objectives as identified in 36 CFR 219.27(c)(3).

g. Constraint: Nonstocked, backlog analysis areas not removed from the suitable timber base to meet alternative objectives are reforested utilizing prescription constraints.

### 8. Alternative G

The purpose is to emphasize visual quality, unroaded elk security areas, wilderness, and semiprimitive recreation opportunities.

The criteria and assumptions underlying the development of this alternative are:

Recommend roadless areas with high wilderness quality and manageable boundaries to wilderness.

Assign Allan Mountain to semiprimitive recreation and other roadless areas to elk security.

Provide moderate level of timber and livestock production.

Protect visual quality in foreground and middleground along existing and potential travel corridors.

The constraints utilized to meet the criteria and assumptions are as follows.

- a. Constraint: Access for timber harvest to each analysis area is limited in the first three decades to the percentage of land that can be unrecovered based on the visual quality associated with the acres assigned to each prescription.
  - Purpose: Assures that the appropriate visual quality objective can be met for each prescription assigned to an analysis area and provides a means to limit openings to 40 acres.
  - Rationale: Constraint is required to meet requirements in 36 CFR 219.27 and alternative objective.
  - Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient analysis areas.
- b. Constraint: Timber harvest area by habitat type-land type combination is constrained by an inventory and scheduled output constraint to meet visual quality objectives by management emphasis, soil and water requirements, and diversity requirements.
  - Purpose: Assure that these objectives and requirements are met on a Forest-wide and watershed basis.
  - Rationale: Required to meet 36 CFR 219.27, soil, water, and visual quality policy requirements.
  - Tradeoff. Reduce PNV by limiting the amount of timber harvest in the most efficient land types and timber types.
- c. Constraint: Major portions of the Blue Joint and Sapphire roadless areas and the Stony Mountain, Needle Creek, Swift Creek, North Big Hole, and Selway-Bitterroot roadless areas are assigned to the wilderness prescription.

Purpose: To meet the objectives of this alternative and help provide a wide range of wilderness

Tradeoff: Reduces PNV primarily because of foregoing positive net timber values in decades 4-6.

d. Constraint: Allan Mountain and parts of the Blue Joint, Sapphire, Sleeping Child, and Selway-Bitterroot roadless areas are assigned to the semiprimitive prescription.

Purpose: Helps meet the roadless dispersed recreation and elk security needs identified in the alternative objectives.

Tradeoff: Reduces PNV primarily because of foregoing positive net timber values in decades 4-6.

e. Constraint: Sawmill and Boulder Research Natural Areas are removed from the suitable timber base with prescription constraints.

Purpose: To meet targets assigned in Regional Guide.

Tradeoff: The economic effect of precluding timber management from 488 acres of research natural areas has not been analyzed.

f. Constraint: Developed recreation sites are removed from the suitable timber base with prescription constraints.

Purpose: To meet the objectives of this alternative.

Tradeoff: The economic effect of precluding timber management

from 461 acres of developed recreation sites has not been analyzed.

5. Constraint: The foreground along moderate and heavily used road and trail corridors is assigned to the roaded retention prescription. The middleground viewing areas adjacent to the areas assigned to the roaded retention prescription are assigned to the partial retention prescription unless they are riparian zones in which case they are assigned to the riparian prescription.

Purpose and Rationale: Inventoried visual quality objectives are utilized along travel corridors to meet the objectives of this alternative.

Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas. In addition, the net timber values are lower in the partial retention prescription because the costs of more expensive logging systems and timber management activities are not offset by cheaper road systems.

Constraint: Winter range that occurs in conjunction with areas inventoried as the modification visual quality objective are assigned to the winter range prescription.

Purpose: Maintain inventoried visual quality objectives and provide optimal habitat for elk on part of the winter range.

Rationale: Meet the objectives of this alternative.

Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas.

- 1. Constraint: Portions of the Allan Mountain, Tolan Creek, Sapphire, and Selway-Bitterroot roadless areas and undeveloped areas in Sleeping Child, Little Sleeping Child, and Skalkaho Creeks are assigned to the unroaded retention prescription. Purpose: To provide unroaded elk security but remain in the land base suitable for timber management. Logging will generally be done with helicopters. Rationale: One of the objectives of this alternative is to provide unroaded elk security areas throughout the Forest. Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas and because the costs of more expensive logging systems and timber management activities are not offset by no road costs.
- J. Constraint: Nonstocked, backlog analysis areas not removed from the suitable timber base to meet alternative objectives are reforested utilizing prescription constraints. Purpose: FORPLAN will not program reforestation. Rationale: Assure regeneration on lands cut to achieve timber production objectives as identified in 36 CFR 219.27(c)(3). Tradeoff: Reduces PNV because the returns on the restocking costs are not realized until 90 years later.

### 9. Alternative H

The purpose is to emphasize market outputs on currently roaded lands and nonmarket outputs including wilderness on roadless areas.

The criteria and assumptions underlying the development of this alternative are:

Emphasize timber production on roaded, suitable lands outside of major travel corridors.

Recommend most unroaded lands for wilderness.

Protect visual quality along existing road and trail corridors.

The constraints utilized to meet the criteria and assumptions are as follows.

a. Constraint: Access for timber harvest to each analysis area is limited in the first three decades to the percentage of land that can be unrecovered based on the visual quality associated with the acres assigned to each prescription.

Purpose: Assures that the appropriate visual quality objective

can be met for each prescription assigned to an analysis area and provides a means to limit openings to 40 acres.

Rationale: Required to meet requirements in 36 CFR 219.27 and alternative objective.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient land types and timber types.

b. Constraint: Timber harvest area by habitat type-land type combination is constrained by an inventory and scheduled output constraint to meet visual quality objectives by management emphasis, soil and water requirements, and diversity requirements.

Purpose: Assure that these objectives and requirements are met on a Forest-wide and watershed basis.

Rationale: Required to meet 36 CFR 219.27, soil, water, and visual quality policy requirements.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient land types and timber types.

c. Constraint: All of the Blue Joint, Allan Mountain, Needle Creek, Swift Creek, Sapphire, Stony Mountain, and Selway-Bitterroot roadless areas are assigned to wilderness except for a few minor boundary changes.

Purpose: Assign a large part of the roadless to wilderness to provide a wide range of wilderness designation.

Rationale: A range of wilderness designation is required in letter to Regional Foresters (Peterson, 1983 May 13).

Tradeoff: Reduces PNV primarily because of foregone positive net timber values in decades 4-6.

d. Constraint: Small portions of Blue Joint, Allan Mountain, Sapphire, Stony Mountain, and Selway-Bitterroot, and all of North Big Hole, Sleeping Child and Lolo Creek roadless areas are assigned to semiprimitive recreation.

Purpose: Provide for a wide spectrum of dispersed recreation opportunities which includes semiprimitive recreation.

Rationale: Meets the objectives of this alternative.

Tradeoff: Reduces PNV primarily because of foregoing positive net timber values in decades 4-6.

e. Constraint: Developed recreation sites are removed from the suitable timber base with prescription constraints.

Purpose: To meet the objectives of this alternative.

Tradeoff: The economic effect of precluding timber management from 461 acres of developed recreation sites has not been analyzed.

f. Constraint: Sawmill and Boulder Research Natural Areas are removed from the suitable timber base with prescription constraints.

Purpose: To meet targets assigned in Regional Guide.

Tradeoff: The economic effect of precluding timber management from 488 acres of research natural areas has not been analyzed.

g. Constraint: The foreground along major roads and trails is assigned to the partial retention prescription except for riparian zones which are assigned the riparian prescription.

Purpose: Protect the most visually sensitive areas along travel corridors.

Rationale: To meet the objectives of this alternative.

Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas. In addition, the net timber values are lower in the partial retention prescription because the costs of more expensive logging systems and timber management activities are not offset by cheaper road systems.

h. Constraint: The winter range prescription is assigned to winter range that occurs on inventoried partial retention visual quality areas on the Forest and on inventoried modification on the west side of the Forest.

Purpose: Provide optimal cover/forage relationships on part of the elk winter range.

Rationale: Meets the objectives of this alternative.

Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas.

1. Constraint: Nonstocked, backlog analysis areas not removed from the suitable timber base to meet alternative objectives are reforested utilizing prescription constraints.

Purpose: FORPLAN will not program reforestation.

Rationale: Assure regeneration on lands cut to achieve timber production objectives as identified in 36 CFR 219.27 (c)(3).

Tradeoff: Reduces PNV because the returns on the restocking costs are not realized until 90 years later.

#### 10. Alternative J

The purpose is to emphasize visual quality, recreation, wildlife habitat, water quality, wilderness, elk security, and diverse hunting opportunities.

The criteria and assumptions underlying the development of this alternative are:

Recommend all roadless areas for wilderness.

Manage riparian zones for wildlife, recreation, and fishing.

Provide a very high level of visual quality in the foreground, middle-ground, and in some cases background areas seen from major roads and trails.

Optimize winter range habitat outside of travel corridors.

The constraints utilized to meet the criteria and assumptions are as follows.

a. Constraint: Access for timber harvest to each analysis area is limited in the first three decades to the percentage of land that can be unrecovered based on the visual quality associated with the acres assigned to each prescription.

Purpose: Assures that the appropriate visual quality objective can be met for each prescription assigned to an analysis area and provides a means to limit openings to 40 acres.

Rationale: Constraint is required to meet requirements in 36 CFR 219.27 and alternative objective.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient analysis areas.

b. Constraint: Timber harvest area by habitat type-land type combination is constrained by an inventory and scheduled output constraint to meet visual quality objectives by management emphasis, soil and water requirements, and diversity requirements.

Purpose: Assure that these objectives and requirements are met on a Forest-wide and watershed basis.

Rationale: Required to meet 36 CFR 219.27, soil, water, and visual quality policy requirements.

Tradeoff: Reduces PNV by limiting the amount of timber harvest in the most efficient land types and timber types.

c. Constraint: Blue Joint, Allan Mountain, Tolan Creek, North Big Hole, Needle Creek, Swift Creek, Sapphire, Sleeping Child, Stony Mountain, Lolo Creek, and Selway-Bitterroot roadless areas are assigned to wilderness.

Purpose: Assign nearly all roadless to wilderness to provide an alternative which maximizes wilderness.

Rationale: A range of wilderness designation is required in letter to Regional Foresters (Peterson, May 13, 1983).

Tradeoff: Reduces PNV primarily because of foregoing positive net timber values in decades 4-6.

d. Constraint: Sawmill and Boulder Research Natural Areas are removed from the suitable timber base with prescription constraints.

Purpose: To meet targets assigned in Regional Guide.

Tradeoff: The economic effect of precluding timber management from 488 acres of research natural areas has not been analyzed.

e. Constraint: Developed recreation sites are removed from the suitable timber base with prescription constraints.

Purpose: To meet the objectives of this alternative.

Tradeoff: The economic effect of precluding timber management from 461 acres of developed recreation sites has not been analyzed.

f. Constraint: Foreground and middleground viewing along road and trail corridors is assigned to the roaded retention prescription with the exception of areas inventoried as retention on the west side of the Forest. These areas were removed from the suitable timber base.

Purpose: Inventoried visual quality objectives are increased one level to provide a very high degree of protection.

Rationale: Required to meet the objectives of this alternative and show the tradeoffs that result.

Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas and because the costs of more expensive logging systems and timber management activities are not offset by cheaper road systems. Removing inventoried retention areas reduces PNV because positive net timber values in decades 4-6 are foregone.

g. Constraint: Riparian zones are removed from the suitable timber base by assigning them to the minimum level prescription.

Purpose: Optimize nonmarket uses in these important wildlife, fish, and recreation areas.

Rationale: Meet the objectives of this alternative.

Tradeoff: Removing riparian zones from the tentatively suitable timber base reduces PNV because positive net timber values are foregone.

h. Constraint: Winter range that occurs on land with the inventoried visual quality objective of maximum modification is assigned to the winter range prescription.

Purpose: Optimizes cover/forage relationships on part of the winter range and increases visual quality on these lands.

Rationale: Meet the visual and elk objectives of this alternative.

Tradeoff: Reduces PNV because timber harvest is limited in the most efficient analysis areas.

### VIII. SUMMARY OF EFFECTS OF CONSTRAINTS, BENCHMARKS, AND ALTERNATIVES

### A. Overview

The purpose of estimating and displaying these effects is to compare present net value, social and economic impacts, outputs of goods and services, and overall protection and enhancement of environmental resources. This comparative analysis is the basis for evaluating alternatives and selecting a proposed action, which are planning steps 7 and 8. This section focuses on the economic effects of alternatives and benchmarks. The constraints are discussed in detail in Appendix B, section VII, and social and environmental effects are discussed in Chapters II and IV.

# B. Process for Evaluating Significant Constraints

Management objectives of benchmarks and alternatives were achieved by constraining FORPLAN as described in section VII. The efficiency tradeoffs of individual objectives can be determined by comparing the PNV of a FORPLAN solution which meets the objective and one which does not. The change in PNV is the efficiency

tradeoff of achieving a specific objective if both solutions have efficient prescriptions, both solutions maximize PNV, and the constraints are cost-efficient. The efficiency tradeoff was not determined for individual alternative objectives because of the prohibitive costs of analyzing every constraint used to develop alternatives. But by comparing alternatives, the economic tradeoffs of the groups of objectives which have the most significant impact on PNV can be determined. These efficiency tradeoffs can then be compared to environmental and social consequences to help identify the alternative which maximizes net public benefits.

A major factor in the economic tradeoff analysis is the order in which the objectives are analyzed. For example, the economic tradeoff of meeting management objectives A and B can be determined by comparing FORPLAN solutions with various combinations of the two objectives. The change in PNV due to meeting only A may be \$5 MM, and the change due to meeting only B may be \$11 MM However, the change due to meeting both A and B will probably be less than \$16 MM. In addition, the cost of meeting objective A in one alternative will not necessarily be the same as meeting the same objective in another alternative. Therefore, the economic tradeoffs discussed in this section are only relevant to the actual alternative where the objectives were analyzed.

### C. Sensitivity Analysis

Sensitivity testing refers to changing an assumption or other input in a model, and then observing the direction and magnitude of the resulting change in the model solution. The "sensitivity" of the model is determined by the magnitude and relative importance of the variables that vary as a result of the model change. For example, if a 25 percent increase in the price of timber resulted in a 1 percent change in first decade timber volume, it would be concluded that first decade timber volume was not sensitive to timber price. A 1 percent increase in timber price that led to a 25 percent increase in timber volume would indicate a situation where timber volume was very sensitive to timber price. Such information allows managers to place confidence in model results based upon the sensitivity of the model to various assumptions.

The economic assumptions that were tested in the sensitivity analysis of the Bitterroot FORPLAN model were those that were thought to be critical in terms of major outputs such as timber volume, suitable timber acreage, and present net value (PNV). Some of the assumptions were tested to respond to specific comments received on the Draft EIS, while others were tested because of internal The following economic assumptions were tested: Forest Service concerns. mileage of road construction; agency cost levels; non-timber output values, harvest constraints in decades 4 through 15; first decade timber volume con-The results of the analysis straints; timber values; and cost and value trends for each of these assumptions is presented in detail below. All other assumptions and constraints in the Proposed Action remained unchanged. As a result of this sensitivity testing, changes were made in the way the Bitterroot FORPLAN model was formulated and revisions have been made in the DEIS Proposed Action that resulted in a Preferred Alternative for the Final EIS that is significantly different from the Proposed Action. Although some assumptions were found to cause major changes in model results, not all of them were changed if the initial assumption was considered the most reasonable assumption to make. Recognition of the sensitivity of model results to such assumptions allows the planning

team and managers to carefully monitor these assumptions since relatively small changes in them could lead to the need for a revision or amendment to the Forest Plan.

A number of variations on the DEIS Proposed Action model were used to make comparisons to test economic assumptions. In the displays that follow, the differences between the results presented in a given table are due to a change in a single assumption. However, from one table to another a different variation of the model may have been used. Thus no conclusions can be drawn by comparing information from different tables. The assumptions tested are as follows:

#### 1. Road Construction Formulation

Accurately accounting for road construction costs at the time and place that they occur is one of the most difficult problems facing forest economics. Between the Draft and Final EIS, the method used in the Bitterroot FORPLAN model was revised to assure that manipulation of road cost information within the model was accurately reflecting assumptions made outside the model. There is additional discussion of the model changes that were made to deal with road construction costs in the section of this Appendix that deals with the FORPLAN model. All management prescriptions requiring access have a sufficient level of road construction to assure adequate access within four decades. All local roads needed for resource management are constructed at the time the area is scheduled for timber harvest. The results of the change in the way road construction is formulated in the FORPLAN model are displayed in Table B-17. Present net value (PNV) increased by \$6 million, harvest volume increased 8 MMBF/year in each of the first two decades and 13 MMBF/year in the third decade, and the suitable timber base fell by 19,000 acres. Those areas that were economically suitable with the apparent low future cost of roads in the original road formulation, became economically unsuitable when the cost of roads in the future was properly accounted for in the model. The results of this analysis show that the model was less sensitive to a revision in the road formulation than some DEIS commenters speculated, but as a result a more accurate way to reflect road assumptions was used to prepare the Preferred Alternative.

Table B-17
Results of Change in Road Costs Formulation in DEIS Proposed Action

	Original Road Formulation	New Road Formulation	
Annual Harvest VolMMBF			
Decade 1	5	13	
Decade 2	17	25	
Decade 3	26	39	
PNV - Million \$	76	82	
Suitable Base - M Acres	447	428	

## 2. Agency Timber Management Costs

A significant portion of the total costs of timber management are Forest Service costs such as regeneration, fuel treatment, sale preparation and administration, and construction engineering. It has been assumed that these costs will remain constant over time, that is, they are not affected by the assumed rates of appreciation that apply to other costs. If the Forest Service costs mentioned above could be reduced through improved efficiency or a change in standards, it could result in an increase in the amount of land suitable for timber management, as well as an improvement in the PNV of all alternatives. The Regional Office has suggested that sale preparation and administration costs could be substantially reduced. All cost items were examined to identify any costs that may have changed since the FORPLAN model was first formulated in the early 1980's, or those costs that might reasonably be expected to decline in the future. The sensitivity of the Proposed Action of the DEIS was tested by reducing regeneration and fuel treatment costs by 25 percent, and engineering, road construction and presale costs by 40 percent. Reductions of this magnitude are considered feasible, although the Bitterroot has not accomplished such cost reductions at this time. As a result of the reduced costs, the PNV of the alternative increased by \$18 million, the first decade harvest volume increased by 10 MMBF/year while the second and third decade harvests were essentially the same. and the suitable timber base increased by 16,000 acres (Table B-18). The PNV increase of 22 percent shows that the model PNV is quite sensitive to a reduction in costs, but the increase in the suitable base is much less sensitive with an increase of only 4 percent. This analysis shows that the Forest Service could profit from a reduction in agency costs associated with timber management. It will be important to monitor these costs, since the suitable timber base would increase with a reduction in costs. Because the ability of the agency to experience cost reductions is speculative, the original cost estimates were used in the model for development of the Preferred Alternative.

Table B-18 Results of Possible Changes in Agency Costs in DEIS Proposed Action  $\underline{\textbf{1}}/$ 

	Original Costs	Reduced Agency Costs
Annual Harvest VolMMBF Decade 1 Decade 2 Decade 3	8 26 39	18 27 38
PNV - Million \$	82	100
Suitable Base - M Acres	417	433

<sup>1/</sup> Assumed changes were a 25 percent reduction in post-sale costs and a 40 percent reduction in presale, roads and engineering costs.

## 3. Non-Timber Output Values

Recreation and Grazing output values were originally included in FORPLAN with no upper limit on the quantity of these outputs that would be valued. Only the levels of recreation and grazing output expected to be used have an economic Any surplus amounts have a zero value. The most convenient way to change the model to value only the amount of recreation and grazing output utilized was to remove these values from the model, and apply the proper amount of total value outside the model. This approach is accurate as long as there is an excess amount of the recreation and grazing outputs produced, as was the case in the Proposed Plan. Because of this change the first decade timber volume declined by 5 MMBF/year while the second and third decades remained the same. The suitable timber base was reduced by 11,000 acres (Table B-19). This means that with the original model formulation, these 11,000 acres had a negative net value from timber management but were brought into solution because of additional value from recreation or grazing. This is not appropriate since any oversupply of these non-timber outputs should have a zero value. Since the original model formulation with recreation and grazing values was inaccurate, the Preferred Alternative was developed with recreation and grazing values added outside the FORPLAN model. The suitable land base was reduced by approximately 11,000 acres in the Preferred Alternative.

Table B-19
Results of Change in Method of Valuing Nontimber Outputs in DEIS Proposed Action

Nontimber Outputs Valued in Model	Nontimber Outputs Valued Outside Model
13	8
25	26
39	39
230	82
428	417
	Valued in Model  13 25 39 230

## 4. Harvest Constraints in Decades 4 through 15

The Proposed Action in the DEIS was modeled with access constraints in the first three decades to limit the proportion of an analysis area that could be accessed and therefore harvested within a single decade while meeting the objectives of an alternative. These harvest constraints could only be applied for 4 decades and were discontinued after the third decade to reduce the costs of running the model. Constraints were also used to limit hydrologic and visually unrecovered areas by working group/land class combinations, and by prescription for decades 1-9. It appeared that timber harvest was increasing in the fourth decade due to the absence of access constraints beyond the third decade, and in the tenth decade because scheduled output and inventory constraints ended in the ninth decade. To the extent that such constraints were necessary to accurately reflect how timber management would actually take place on the Forest, the amount of land in the suitable base could be over estimated with the original

formulation. The sensitivity of the Proposed Action to limited harvest constraints was tested by adding a constraint on total harvest acreage which served as a less expensive proxy for the area specific constraints. The result was that the PNV changed by less than \$1 million, the long-term sustained yield declined by 2 MMBF/year, and the suitable base was reduced by 20,000 acres (Table B-20).

The addition of a harvest constraint resulted in a model formulation that was more realistic and accurate. This constraint was included in the model that was used to develop the Preferred Alternative.

Table B-20
Results of Change in Harvest Constraints in DEIS Proposed Action

	Original Constraints Decades 1-3	Revised Constraints  Decades 1-15
Annual Harvest VolMMBF  Decade 1  Decade 2  Decade 3  Decade 4	24.8 24.8 31.4 44.7	24.8 24.8 31.6 42.0
PNV - Million \$	80.4	79.6
Suitable Base - M Acres	419	399

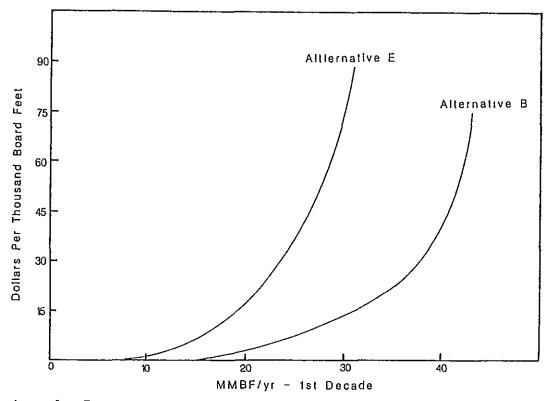
# 5. First Decade Timber Volume

In the DEIS all alternatives were constrained to produce 95 percent of the maximum timber volume possible in the first decade while meeting alternative objec-Since all alternatives also had an even flow constraint, the first decade constraint also had an affect on all subsequent decades. period between the Draft and Final EIS, the marginal cost of the first decade timber constraint was examined to provide managers with information on the cost of incremental amounts of timber in the first decade. First decade timber volume was of particular interest because of the needs expressed by the local timber industry. With the assumption of appreciating timber values, the highest PNV can be achieved in many areas by delaying harvest until future decades. Although this would maximize PNV, the delayed harvest schedule could be detrimental to the timber industry. By examining the costs, both monetary and nonmonetary, of increasing the first decade volume, the tradeoffs associated with a specific timber volume can be displayed. Removing the first decade timber volume constraint from the model provides an indication of the "efficient" first decade volume that would maximize the PNV of the alternative. The first decade timber volume constraint was then reintroduced at incremental levels until the 95 percent of the maximum timber volume in the first decade was reached. noting the marginal cost of the first decade timber volume constraint, it is possible to construct a marginal cost curve for the entire range of volume considered (Figure B-3). In addition to the Proposed Action, the same procedure was used on Alternative B which represented an alternative with a relatively high commodity emphasis. Since Alternative B has a larger land base assigned to

timber management and fewer management restrictions, the marginal cost of any given volume of timber is less than the same volume with the Proposed Action (Figure B-3). Additional timber volume in the first decade can be produced by bringing more land into the timber base, by increasing the intensity of management (such as increasing the level of commercial thinning), or by changing the harvest schedule. In all cases, additional volume above the level in an unconstrained model will result in a lower PNV. As the first decade volume requirement grows, increasingly expensive measures such as harvesting on steep, high elevation lands or helicopter logging will be necessary to meet the constraint. This is the reason that the slope of the curve gets very steep and the marginal cost gets very high for additional volume as the constraint approaches the biological upper limit for the alternative.

The marginal cost curve clearly shows the economic trade-offs of additional volume in the first decade. Much less clear are the implications of first decade volume changes for timber sale projects. Direction from both the Chief of the Forest Service and Regional Forester specifies that the agency will not offer timber sales when the expected costs exceed expected returns, unless there are non-timber resource reasons for doing so. First decade timber volume was constrained to 95 percent of the maximum timber level to provide community stability by maintaining timber related jobs and income. However, as the marginal cost curve shows the cost of the last increment of timber volume will be quite expensive. It will take market conditions that are significantly improved from the existing situation before the Forest will actually be able to sell the total timber volume since a component of the volume will be relatively costly as mentioned above. Further discussion of this topic is included in the section on project economics in the Implementation Section of the Forest Plan.

Figure B-3 Marginal Cost - First Decade Volume



In addition to changes in monetary costs, other impacts associated with the first decade timber volume constraint are displayed in Table B-21. On the Bitterroot Forest, additional volume is achieved in the first decade primarily by harvesting areas earlier than would be the case in the absence of the volume constraint. This is shown by the relatively constant level of land in the suitable base at varying levels of first decade timber volume.

The marginal value of individual timber prescriptions was examined to determine the impact of changing the first decade volume constraint. In this way it was possible to determine if areas brought into timber management were reducing the total value (PNV) of the Plan, because areas with a negative net value are often scheduled in order to meet a constraint. In the Proposed Action the incidence of such negative net value areas increased as the first decade timber harvest level increased. However the total acreage of negatively valued areas was quite small, and the reduction in PNV was almost entirely the result of scheduling areas for harvest at other than the optimal economic period. In most cases this meant a reduction in the marginal value of the area, but the net value was still positive.

Table B-21 Changes in Selected Outputs as First Decade Timber Volume Increases -Alternative B and the DEIS Proposed Action

	First Decade Timber Volume (MMBF)	Change in Sultable Base (M ACRES)	First Decade Harvest Acreage (M ACRES)	Present Net <u>Value</u> (MM \$)	Marginal Cost (\$/MBF)
Alternative B	15.2	0	14.1	131.2	0
	26.8	-0.8	23.9	130.4	9.5
	34.0	-2.1	30.9	129.4	19.0
	38.8	-0.6	35.5	128.1	33.2
	43.2	-0.3	39.4	125.7	75.7
Alternative E (DEIS Proposed Action)	8.2	0	7.6	82.3	0
	20.0	+1.3	18.3	81.5	15.1
	24.8	+1.9	23.0	80.4	34.9
	28.0	+2.6	26.0	78.9	64.2
	30.8	+2.4	29.4	76.9	87.1

#### 6. Timber Values

Many reviewers felt that timber values used in the DEIS were too high. Timber values used in the DEIS were based on bid prices on the Bitterroot Forest from 1974-1980. Since 1980 prices have generally declined. To adjust the prices to a wider base period, that includes both high and low points in the lumber market, a 10 year average price was calculated using actual receipt data for the years 1975-1984. Variations in value due to timber species, diameter, harvest volume per acre, and logging method were modeled using the latest (1984) Transaction Evidence regression equation (Merzenich, 1985).

The average stumpage value using 1974-1980 sales data was \$90.34/MBF and the average stumpage value using 1975-1984 receipts was \$67.18/MBF, a reduction of 26 percent. The sensitivity of the FORPLAN solution to the change in timber value was not tested by itself since the value of timber used in the model was affected by both the initial stumpage value and the rate of increase that was assumed for future time periods. The results of changes in both timber values and appreciation rates is presented in the next section.

## 7. Appreciation Rates

Another assumption that received considerable public comment was the expected increase in timber value and timber production costs. The majority of commenters expressed a belief that the assumed trends were too high. The trends used in the DEIS were based upon research work done by Adams and Haynes for the 1980 RPA (Haynes and Adams, 1980). These trends have subsequently been reestimated for the 1985 RPA program (USDA, 1986). The new trend rates are lower and reflect market conditions in the first half of the 1980 decade. Table 6 shows the lumber price and production cost trends associated with the original and revised estimates. Regional average stumpage prices, as projected by both sets of projections, are also shown. In both cases increases are not projected beyond the fifth decade (year 2030).

Table B-22 Annual Percentage Increase by Decade

 		<del></del>	Decade				
	_1_	_2_	_3_	<u>4</u>	_5_	_6_	Cumulative
		Т	imber Va	lue			
(1980 RPA) (1985 RPA)	2.7% 0.0%	1.7% 2.0%	1.3% 0.6%		1.1% 0.7%	0.0% 0.0%	219% 150%
		Pro	duction	Costs			
(1980 RPA) (1985 RPA)	2.3% 0.0%	1.8% 2.2%	0.2% 0.3%	0.2% 0.3%	0.2% 0.4%	0.0% 0.0%	160% 137%
		Average	Stumpage	Price/M	BF		
(1980 RPA) (1985 RPA)		107.61 69.03					

The revised timber values are lower and the new value trends are also lower than what was used in the original FORPLAN model. The result is a compound effect that makes timber management much less profitable with the revised assumptions for timber values and appreciation rates. When the model was run with the new timber value and appreciation rate the result was an expected reduction in both the PNV and the land base that was suitable for timber management (Table B-23).

Table B-23 Results of Change in Timber Prices and Price/Cost Trends in the DEIS Proposed Action

	Original Prices and Trends	New Prices and New Trends	New Prices and No Trends
Annual Harves VolMMBF Decade 1 Decade 2 Decade 3	9 25 34	7 9 24	2 4 4
PNV - Million \$	73	13	12
Suitable Base - M Acres	388	299	279
Long-Run Sustained Yield - MMBF	45	34	30

This analysis shows that the model was quite sensitive to the assumed timber price and price/cost trends. With the new prices and trends the suitable base fell by 23 percent and the long term sustained yield fell by 24 percent. The reduction in suitable base of 89,000 acres shows that this acreage is profitable only when the higher price trends from the 1980 RPA are used. In general, the land types that are unsuitable with the lower prices and price/cost trends are the steeper lands with little or no existing road access. These lands tend to be more expensive to manage for timber production because of higher logging and road construction costs.

Since the model was quite sensitive to revised timber prices and price/cost trends, another model run was made with all price and cost trends reduced to zero which held current prices and costs constant throughout the 15 decades considered. The results of this new assumption are also shown in Table 7 when the change is applied to the Proposed Action alternative. Removal of price/cost trends resulted in a further reduction in the land base suitable for timber production and the associated long term sustained yield (LTSY). The suitable base declined another 7 percent (20,000 acres) and the LTSY fell an additional 12 percent (4 MMBF/year). This comparison shows that the change in the suitable base was relatively small between the zero trend and the 1985 RPA trends, but increasing the trends to the higher 1980 RPA level has a significant impact on adding land to the suitable timber base.

Areas of the Forest that become unsuitable when price/cost trends are removed entirely are primarily the unroaded and partially roaded areas with steep slopes and high management costs, and areas with low timber volumes and/or slow growth. When there is no economic advantage to delaying timber harvest due to assumed future increases in value, the economically efficient harvest level stays relatively low throughout the 15 decades considered. This analysis supports the contention of some commenters on the DEIS that if higher timber prices do not materialize in the future, the Forest will be attempting to manage for timber on economically unsuitable areas.

This sensitivity analysis shows that the PNV, suitable timber base and harvest volume are all quite sensitive to the assumptions that are made for timber prices and price/cost trends. However, if the first decade timber volume is constrained at a relatively high level, as it is in all alternatives, then only the PNV will change significantly as values and trends are varied since both the suitable base and harvest volume start out at high levels. Timber prices and price/cost trends will be monitored, and if future timber prices do not increase as assumed, then the total PNV of the Preferred Alternative would be less than predicted. Because of the constraint on first decade timber volume, the timber volume in the first decade would not be expected to change if prices and trends are different than assumed levels.

When price/cost trends were removed entirely from other alternatives, the suitable timber base fell between 160,000 and 210,000 acres. The impact of price trends on both the schedule of timber harvest and present net value (PNV) is also clear with the results of these model runs. Since much of the timber that is harvested when there are no price trends is scheduled for harvest in later decades, the PNV is much lower because of the effect of discounting.

The sensitivity of other alternatives to the 1985 RPA price/cost trends was also examined. The Max PNV Benchmark and Alternative B, a relatively high commodity alternative were chosen for this part of the analysis. The results were very similar to those discussed in the previous section. In both cases, the PNV declined, first decade volume fell, and both the suitable acreage and long-term sustained yield (LTSY) dropped.

The Max PNV Benchmark is the most accurate indicator of sensitivity of the suitable base since constraints, which may force otherwise unsuitable land into timber management, are minimized in the Benchmark run. Table B-24 shows the result of changing timber prices and price/cost trends to the 1985 RPA values for the Max PNV Benchmark. With the 1985 RPA values the first decade volume declines by 34 percent, the long run sustained yield falls by 30 percent, the suitable timber base is 29 percent less and the PNV falls by 81 percent. Thus in relative terms, the Present Net Value is by far the most sensitive to price and trend changes of the variables reported in this analysis. Alternative B is also displayed in Table B-24 with both the original and the 1985 RPA values. In this alternative the first decade volume is constrained at 43 MMBF/year so there is no opportunity for any change in terms of timber volume. With the 1985 RPA values the suitable timber base is 10 percent less, the long run sustained yield falls by 10 percent and the PNV drops by 86 percent.

From this comparison it is clear that other alternatives would show similar effects of the 1985 RPA values with the magnitude of change influenced by the original suitable base and the first decade constraint on timber volume. For

the other alternatives the suitable timber base would fall by approximately 10-30 percent, the long run sustained yield would fall by a similar amount, and the PNV would change the most at approximately 80-90 percent. Because of the cost of re-running all alternatives, approximations of the magnitude of change were used to estimate the impact of the 1985 RPA values on the alternatives. All information presented in the EIS is based upon program runs which used the original 1980 RPA values.

Table B-24 Results of Change in Timber Prices and Price/Cost Trends with the MAX PNV Benchmark and Alternative B

	Max PNV Ber Prices and Original		Alternati Prices and Original	<b>-</b> -
Annual Harvest VolMMBF Decade 1 Decade 2 Decade 3	59 69 69	39 39 53	43 43 43	1/ 43 43 43
PNV - Million \$	162	31	274	37
Suitable Base - M Acres	564	398	543	491
Long-Run Sustained Yield - MMBF	76	53	68	61

<sup>1/</sup> First decade volume constrained at a level equal to or greater than 43 MMBF/year.

# 8. Summary

Economic assumptions that were thought to be critical in terms of major variables were tested for sensitivity with the FORPLAN Model. The main items of interest were annual timber harvest during the first decade, suitable timber acreage and present net value (PNV). The results of the analysis for each of the economic assumptions is presented in Table B-25.

In preparation of the Final EIS, some economic assumptions were tested after the Draft EIS: 1) The method of accounting for road costs was revised and this resulted in an increase in both first decade volume and present net value (PNV), but a reduction in the suitable timber base. 2) Possible reductions in agency and road construction costs are speculative at this time, so the original assumptions were maintained. 3) Valuing recreation and grazing outside the model was more accurate than the method used in the DEIS. The result of this new valuation method was an increase in PNV and first decade timber volume, but a reduction in the suitable timber base. 4) A harvest constraint was added to assure that multiple use objectives would be met in decades 4-15. This change resulted in a reduction of the suitable base, a slight reduction in long-term sustained yield, and a minor change in PNV. 5) The FORPLAN model was shown to be quite sensitive to timber prices and price/cost trends. As a result of the sensitivity, the suitable base for the Preferred Alternative will be closely

monitored to avoid timber management activities on those lands that require higher timber prices and trends in order to be suitable.

A new alternative, E2, was developed to reflect changes that were made in the FORPLAN Model as a result of the sensitivity analysis, and to respond to issues that were presented by the public and government agencies during the comment period on the Draft EIS. Output levels associated with Alternative E2 are presented in Table II-26 of the FEIS. As reported in this analysis, some variables were sensitive to changes in economic assumptions used in the FORPLAN model. All other alternatives would display similar changes if the FORPLAN model were run again using the newer assumptions. Because of the high cost and time required to re-run all alternatives, the following approximations are provided to adjust the values displayed in Table II-26 of the FEIS. The new assumptions have an impact primarily on the determination of some lands in the suitable timber base. For all alternatives other than the Preferred Alternative, the suitable timber base reported in Table II-26 would be reduced by approximately 5 percent if the road formulation were changed, reduced by approximately 3 percent if non-timber outputs were valued outside the model and reduced by approximately 5 percent if the harvest constraints were changed. The change in economic assumptions would not have an affect of first decade timber volume since it was constrained in each alternative. Finally, although the PNV was sensitive to a change in the assumption of valuing non-timber outputs, the appropriate procedure was used in the original DEIS display for all alternatives so no adjustment is necessary in Table II-26.

Table B-25
Impact of Economic Assumptions on First Decade Timber Volume, Suitable Timber Base and Present Net Value

Assumption	First Decade Timber Volume (MMBF/Year)	Suitable Base (M Acres)	PNV (MM \$)
Change to New Road Formulation	13 (+)	428 (-)	82 (+)
Reduction in Agency and Road Cost	18 (+)	433 (+)	100 (+)
Nontimber Outputs Valued Outside Model	8 (-)	417 (-)	82 (-)
Change Harvest (Access) Constraints	NA *	399 (~)	80 (-)
New Timber Prices and Trends	7 (-)	299 (-)	13 (-)
No Price or Cost Trends	2 (-)	279 (-)	12 (-)

Increase (+) or decrease (-) in variable compared to level associated with original assumption in DEIS

<sup>\*</sup> These constraints do not affect first decade timber volume

## D. Timber Supply/Demand and Timber Resource Land Suitability

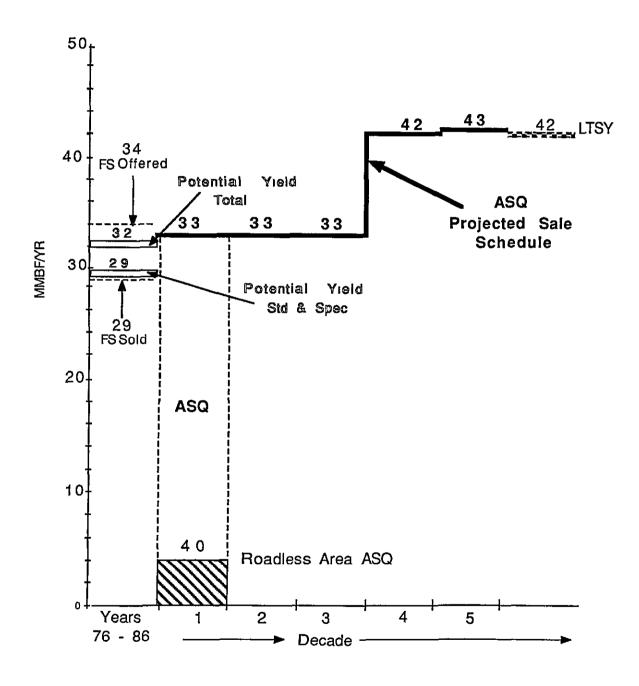
The public in their review of the DEIS raised questions about the timber supply and what effect changes in demand would have on the Preferred Alternative. New information became available between the DEIS and FEIS from the State of Montana Timber Supply and Demand Study (Flowers and others, 1987). Public review comments asked why lands in the suitable timber base were at the level stated in the Preferred Alternative. The timber industry and others asked about possible opportunities for increasing the allowable sale quantity (ASQ) in the Preferred Alternative if the demand (price) for wood were to dramatically increase. Further analysis was done both to incorporate the information from the Montana study and to respond to the public comments with additional information on the Preferred Alternative.

### 1. Timber Supply/Demand

A timber supply study was completed for the State of Montana (Flowers and others, 1987) to examine the possible supply scenarios, by ownership, from 1985 through the year 2030. The study indicates there will be adequate timber volume available during the plan period of the Preferred Alternative in the market area served by the Bitterroot Forest. The study did indicate there will be an increase in the demand for wood products. In the statewide analysis, the volume of timber available from state lands was fixed at 11 MMBF/year for the Southwest Area, which includes the Bitterroot Forest. Private timber volume was estimated to remain stable at 41 MMBF/year for the 45 years covered in the study. National Forest volume was expected to be in the range of 114-144 MMBF/year in 1985 and increase to 276-427 MMBF/year by 2030 in the Southwest Area by assuming that all National Forests implement their Draft Forest Plan Proposed Action alternatives. The increase if demand for Bitterroot National Forest timber is a result of both increasing demand for stumpage in Montana and decreasing supply from all other ownerships. This reflects the significant decline in harvests on industrial lands due to inventory depletion.

Figure B-4, Supply and Demand Relationships graphic, displays the ASQ and projected sale schedule for the Bitterroot Forest. The Bitterroot National Forest (NFS) demand indicates that demand is projected to exceed supply starting in the third decade.

Figure B-4 Historic and Projected Volumes



## 2. Timber Resource Land Suitability

Further analysis was done on the amount of suitable timber acres in the Preferred Alternative. The results are shown in Table B-26a, Timber Resource Land Suitability, and Table B-27, Suitable Timberland by Working Group and Land Table B-26b, provides the definitions for the terminology used in the Timber Resource Land Suitability Table. Tentatively suitable timber lands were identified earlier in Section II of this Appendix on page B-4. suitability table further classifies the tentatively suitable lands into Suitable and Tentatively Not Appropriate. Under the Suitable category, the total acres were separated into three additional categories. The analysis indicates that of the 33.4 MMBF/year ASQ amount for the first decade in the Preferred Alternative, about 24.0 MMBF/year is in the Direct Benefits Exceed Direct Costs category. The other 9.4 MMBF/year is in the Local Jobs/Income category. This volume is produced with a timber volume constraint for the first decade designed to respond to issues and concerns related to jobs and income. Responding to the public concern for jobs and income resulted in an addition of 26,489 acres to the suitable base. The total PNV of the Preferred Alternative is \$99,000,000.

The allowable sale quantity is made up of the following non-interchangeable components: 31.2 MMBF per year green sawtimber and 2.2 MMBF per year salvageable material. In addition:

- 1.9 MMBF per year of the ASQ is scheduled from land designated for development in the Blue Joint and Sapphire Montana Wilderness Study Act areas. This volume will not be available until Congress acts on MWSA.
- 2.9 MMBF per year of the ASQ is scheduled from steep lands which will require helicopter yarding low value species including, lodgepole pine, Douglas-fir, and subalpine fir.
- 5.7 MMBF per year of the ASQ is scheduled to come from sandy, decomposed granite soil land types which are difficult to develop and maintain fish habitat.

The analysis indicates that the Bitterroot Forest is at a threshold of costs for the acres in the suitable portion of Table B-26a. Lands in the category Tentatively Not Appropriate, and under the item Lands Not Cost Efficient to Meet Objectives-Future Timber Production Possible, incur very high costs. Most of the lands in this category are found on steep slopes (40 to 60 percent and greater) in all the vegetation habitats except riparian. Consequently, even with an increase in timber prices in the first decade, only 150 acres are identified as additional opportunity within the Preferred Alternative. This additional sale opportunity NFS is shown in Figure B-4. While identified as an opportunity, no change is proposed in the Preferred Alternative because of the very high timber prices that would be required before these lands would become economically suitable. If such a substantial change in timber prices should occur, it would be identified in the monitoring activity, and could lead to an amendment to the Forest Plan.

Alternative E2 assigns 143,170 acres of tentatively suitable inventoried road-less timberland to semiprimitive recreation, and 24,700 acres to recommended wilderness. Most of these 167,870 acres support low value species and volumes on steep slopes with sensitive soils. Table B-27 shows suitable timberland by

Table B-26a Timber Resource Land Suitability

	NOT SUITED	ACRES	Allowable s		
		h	includes 31	.2 MMBF gre	een sawtim-
Not Cap	able and Non Forest	499,610	ber and 2.2		
	sible Soil	0	post, pole, changeable		
	ershed Damage	0	also includ		
	rance of	alı =22	ume, 2.9 10		
	e Restocking	34,533	volume, and		
	wn from	457,408	granitic so		Suriay,
Timber_	Production	457,400	This analys		d on 1980
Subtate	al of Above	991,551	RPA prices		
Subcoce	ar or moove		Definitions		
F			Table B-27.		•
ô					
R					
E					
s	SULTABLE			EFFECTS	
T T			1st De		LTSY
E E				MMBF	
D N	LANDS COST EFFICIENT:		Acres	(ASQ)	MMBF
T	Direct Benefits		0-	-t	
A A	exceed Direct Costs	363,331	2,180	24.0	-
N T	Direct Cost exceed				
DΙ	Direct Benefits:				
<u> </u>	Meet Non Timber	_			
N E	M U Objectives	0	0	0.0	<del>-</del>
0 L	Local Jobs/Income	26,489	938	9.4	42.1
N Y	Subtotal	389,820	3,118	33.4	42.1
 F S	TENTATIVELY NOT		BESUI	JRCE OPPORT	עידוויר עידוווי
0 U	SUITED		1st Dec		LTSY
RI	3011150		Acres	MMBF	MMBF
E T	Lands not cost		110105		111111
S A	Efficient to Meet				
T B	Objectives-Future				
E L	Timber Production				
D E	Possible	28,642	150	1.7	_
ĨÏ	Multiple-Use	,_,_			
	Objectives Preclude		1		
	Timber Production:				
	Other Uses	143,170	-	_	-
	Proposed				
	Wilderness	24,700	_	<u> </u>	
	Subtotal	196,512	150	1.7	-
		4 === 000			
TOTAL	NATIONAL FOREST LANDS	1,577,883		<u> </u>	

Table B-26b Timber Resource Land Suitability Definitions

NOT SUITED LANDS			
Not Capable	Forest land not capable of producing industrial wood Quantitatively defined as lands not capable of producing 20 cubic feet of wood per acre per year		
Non-Forest	Land that is not at least 10 percent occupied by forest trees of any size formerly having had such tree cover and currently developed non-forest use 36 CFR 219 14(a)(1)		
Irreversible Soil & Watershed Damage	36 CFR 219 14(a)(2)		
No Assurance of Adequate Restocking	36 CFR 219 14(a)(3)		
Withdrawn from Timber Production	36 CFR 219 14(a)(4)		
TENTATIVELY SUITABLE LANDS			
SUITABLE PORTION			
Direct Benefits Exceed Direct Costs	Direct benefits expressed as expected gross receipts to the government Expected receipts are based upon expected stumpage prices and payments-in-kind from timber harvest considering future supply and demand situation for timber and upon timber production goals of the Regional Guide 36 CFR 219 14(b)(1).  Direct costs include the anticipated investments, maintenance, operating, management, and planning costs attributable to timber production activities, including mitigation measures necessitated by the impacts of timber production 36 CFR 219 14(b)(2).		
Meet Non-timber, Multiple-Use Objectives	Lands where timber production is necessary to achieve non-timber, multiple-use objectives even though direct timber production costs exceed expected gross receipts to the government. These objectives are not assigned monetary values but are achieved at specified levels in the least cost manner. See 36 CFR 219 14(c) and 36 CFR 219 3 (definition of cost efficiency)		
Local Jobs/Income	Lands necessary for timber production in order to maintain an appropriate level of local employment and income. (No direct basis in the planning regulations; See 36 CFR 221 3(a)(3)		
Non-Interchangeable Component	Non-Interchangeable Components (NICS) are defined increments of the suitable land base and their contribution to the allowable sale quantity (ASQ) that are established to meet Forest plan objectives NICS are identified as parcels of land and the type of timber thereon which are differentiated for the purpose of Forest plan implementation. The total ASQ is derived from the sum of the timber volumes from all NICS. The NICS cannot be substituted for each other in the timber sale program. Some conditions which may characterize a particular NIC are (1) species marketability, (2) dead or live timber; (3) timber size class, and (4) operability.		
NOT SUITED PORTION			
Lands Not Cost Efficient to Meet Objectives-Future Timber Production Possible	Lands not currently cost efficient for timber production but which could be brought into production if conditions change. These lands represent additional opportunities within the preferred alternative.		
Multiple-Use Objectives Preclude Timber Production	Based upon a consideration of multiple-use objectives for the aternative, the land is proposed for resource uses that preclude timber production 36 CFR 219 14(c)(1)		

working group and land class for Alternatives E2 and A. Alternative A is used for comparison since most of the roadless tentatively suitable timberland is suitable in this alternative, therefore, the acreage difference between these two alternatives represents the acres assigned to roadless management in Alternative E2. The range of PNV per acre is shown for each working group-land class combination for decade 1 and for the planning horizon. A range is shown for PNV since both roaded and roadless components are included in each working group-land class combination. The actual PNV of a roadless analysis area depends on decade of harvest, access requirements, management prescription, and timber condition class which identifies species, age, tree size, and volume.

Table B-27
Suitable Timberland by Working Group and Land Class - Alternatives A and E2

Land				P	NV \$/Acre		
Land Class	Alternative Acreage			Decade 1	150 Year		
	E2	A	A-E2	Range	Range	Average	
-40	70	72 56	2	-229/+866	-299/+866	+271	
S40M60	96	122	26	-286/+171	-286/+408	+198 +81	
55+60	13	1/	4	-215/ <b>-</b> 215	-275/+234	+33	
-40 MN+40	46 14	70 29	24 15	+47/+718 +64/+436	-54/+739 -186/+545	+233 +156	
S40M60 SS+60	29 1	90 2	61 1	-273/ <b>-</b> 8 NA	-273/+367 -3/+183	+55 +40	
-40 MN+40	1 <u>4</u> 4	20 4	6 0	+258/+1966 +529/+1813	-14/+1966 -31/+1813	+426 +517	
s40m60 ss+60	11 1	21 4	10 3	-523/+922 -61/-61	-523/+922 -61/+196	+184 +31	
-40	19	25	6	+856/+1131	-306/+1131	+320 +87	
	MN+40 S40M60 SS+60 -40 MN+40 S40M60 SS+60 -40 MN+40 S40M60 SS+60	MN+40 49 S40M60 96 SS+60 13  -40 46 MN+40 14 S40M60 29 SS+60 1  -40 14 MN+40 4 S40M60 11 SS+60 1  -40 19	MN+40 49 56 S40M60 96 122 SS+60 13 17  -40 46 70 MN+40 14 29 S40M60 29 90 SS+60 1 2  -40 14 20 MN+40 4 4 S40M60 11 21 SS+60 1 4  -40 19 25	MN+40 49 56 7 S40M60 96 122 26 SS+60 13 17 4  -40 46 70 24 MN+40 14 29 15 S40M60 29 90 61 SS+60 1 2 1  -40 14 20 6 MN+40 4 0 S40M60 11 21 10 SS+60 1 4 3  -40 19 25 6	MN+40 49 56 7 -75/+684 S40M60 96 122 26 -286/+171 SS+60 13 17 4 -275/-275  -40 46 70 24 +47/+718 MN+40 14 29 15 +64/+436 S40M60 29 90 61 -273/-8 SS+60 1 2 1 NA  -40 14 20 6 +258/+1966 MN+40 4 4 0 +529/+1813 S40M60 11 21 10 -523/+922 SS+60 1 4 3 -61/-61  -40 19 25 6 +856/+1131	MN+40	

Most of the roadless area occurs on working group HT4 which is habitat type AF/beargrass and supports mostly lodgepole pine, and on steep slopes or sensitive soils as indicated by land classes S40M60 and SS+60 which are the sensitive soils on slopes over 40 percent and the moderate- to non-sensitive soils on slopes over 60 percent.

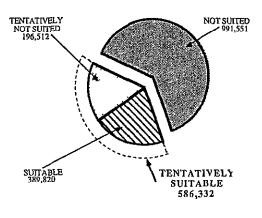
A large part of the roadless area, 61,000 acres, occurs on working group HT4 and land class S40M60. The PNV per acre is all negative in decade 1 and ranges up to a plus \$367 sometime during the 150 year planning period. However, the positive end of the range represents lands that are currently roaded and the negative end represents the inventoried roadless lands which require significant road investments prior to timber harvest. In general, the roadless land PNV's fall below the averages and are mostly negative if harvest is required in early decades but may become slightly positive if harvest is delayed to take advantage of future price increases.

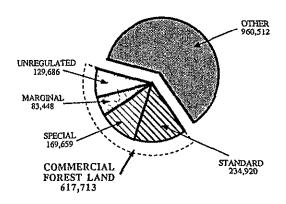
Figure B-5 shows a comparison of the commercial Forest Land Classification, used in previous Forest timber management plans, with the Forest Plan Preferred Alternative land suitability classification.

Figure B-5 Acres Classification

> FOREST PLAN TIMBER RESOURCE LAND SUITABILITY Total Acres: 1,577,883

PREVIOUS COMMERCIAL FOREST LAND CLASSIFICATION Total Acres 1,578,225





# E. Tradeoffs Among Alternatives

The discussion in this part focuses on economic tradeoffs. Resource outputs and socioeconomic effects are displayed in Chapter II, and environmental effects are discussed in Chapters II and IV, FEIS.

## 1. Response to Issues

Alternatives were designed to address the six major issues. A single alternative cannot fully resolve all issues because of the conflicts among issues. Table B-28 compares the response of each alternative to the major issues in terms of nonpriced benefits. A detailed discussion of issues is in Appendix A.

Table B-28
Present Net Value and Nonpriced Benefits by Alternative

	Unit of	Alternatives									
	Measure	A	В	C	F	Н	E2	E	G	E1	J
Present Net Value (4%)	MMS	148	143	125	103	103	99	96	91	85	62
Nonpriced Benefits											
Visual quality .	M acres retention and partial retention	0	91	84	126	62	117	106	179	106	194
Semiprimitive recreation	M acres roadless	133	100	111	242	73	214	197	95	197	0
Wilderness	M acres	743	793	841	793	1040	820	820	915	820	1144
Elk Security	M acres addi- tional roadless	0	0	0	39	0	30	3	22	3	0
Diversity	% in 100 years										
Seedling/sapling Poletimber Sawtimber Old Growth		37 29 25 9	40 29 20 11	34 27 21 18	30 25 21 24	33 27 22 19	29 24 27 20	28 25 29 18	26 23 24 26	31 24 25 20	24 20 24 33
Nonwilderness fish in 100 years	M catchable trout	113	147	124	134	136	161	137	131	137	161
Local employment in first decade	Average annual change in jobs from 1980	350	260	220	20	-40	-10	80	60	210	-170

#### 2. Economic Tradeoffs

This discussion identifies the economic consequences of implementing the alternatives by comparing each alternative to Benchmark K and to at least three other alternatives: the next cheapest alternative in terms of foregone values, the next cheapest alternative in terms of foregone values, and Alternative F. In some cases, alternatives with similar objectives are also compared. The comparisons form the basis for balancing economic tradeoffs with nonpriced resource outputs in selecting the preferred alternative. In this discussion, economic efficiency only considers the monetary value of the Forest as measured by PNV. In Chapter II, FEIS, efficiency includes nonpriced values of the Forest.

One measure of the cost of an alternative is the discounted cost which represents the equivalent payment required by the government to implement an alternative. The minimum discounted cost for federal ownership is defined by Benchmark M as \$81 million. Table B-29 displays the discounted costs, discounted benefits, and PNV in order of increasing costs. In general, the costs of alternatives increase with the size of the timber and road construction programs. These costs range from \$185 million for Alternative J to \$235 million for Alternative A.

Table B-29
Costs, Benefits, and Present Net Value Discounted at 4 Percent for Alternatives (million dollars)

Alternative	Discount	ted Costs	Discounte	ed Benefits	Present Net Value		
	Total	Change	Total	Change	Total	Change	
J	185		247		62		
E2	191	>6	290	>43	99	>37	
		>0	-	>4	))	>4	
F	191	>6	294	>6	103	\0	
Н	197	70	300	70	103	>0	
П	212	>16		>9		>-7	
E	213	>1	309	>-4	96	>-5	
G	214		305		91		
E1	221	>7	306	>1	85	>-6	
		>7		>47		>40	
С	228	>5	353	>23	125	>18	
В	233		376		143		
A	235	>2	383	>7	148	>5	

By comparing the benefits and costs of an alternative with the next cheapest alternative, the economic consequences of the additional expenditure can be compared to the additional nonpriced benefit values.

Another measure of the cost of an alternative is the change in PNV between alternatives. The maximum PNV of the Forest is defined by Benchmark K as \$206 million. The difference between \$206 million and the PNV of an alternative represents the foregone investment opportunity to the government for implementing that alternative. Table B-30 displays the discounted costs and benefits by resource and the PNV in order of decreasing PNV. In general, the PNV of alternatives increases with the size of the timber program. Changes in the timber program are caused by constraints which preclude regulated timber harvest, disperse timber harvest over the landscape, and set a timber harvest objective in decade 1. By comparing each alternative with the alternative having the next highest PNV, the incremental economic tradeoffs can be compared to the incremental nonpriced benefits.

Table B-30
Benefits and Costs Discounted at 4 percent by Resource Groups for Alternatives

Alter-	Present Net					Discounted Costs					
native	Value	Timber	Recre- ation	Range	Other	Timber	Roads	Recre- ation	Range	Other	
A	148	202	173	6	2	58	46	12	3	116	
В	143	196	172	5	2	55	47	12	3	116	
С	125	173	173	5	2	50	42	18	2	116	
F	103	119	167	5	2	43	29	11	2	106	
Н	103	118	175	5	2	35	24	21	3	114	
E2	99	120	163	5	2	47	18	20	2	104	
3	96	131	170	5	2	44	32	20	2	115	
3	91	125	173	5	2	40	27	29	2	115	
E1	85	128	170	5	2	46	37	20	2	116	
г	62	65	176	4	2	26	14	29	2	113	

The discounted benefits of a resource group are not necessarily comparable to the discounted costs because of joint production functions and nonseparable costs.

The economic consequences of changing from the current land assignment, output schedule, and budget are defined by comparing the PNV of the alternatives with the PNV of Alternative F and Benchmark X. Except for Alternative J, alternatives allow for a more efficient land assignment and output schedule than the current direction. However, most of the potential to increase efficiency is traded off in all alternatives for higher levels of road maintenance, fire protection, general administration, timber sale preparation, and timber sale

administration. These costs reflect the objective to manage the Forest to resolve issues and concerns and to reduce the risk of resource damage and loss of investment.

#### a. Alternative A

Alternative A provides a high level of market resources with very little consideration for nonmarket outputs outside of existing wilderness. Timber harvest is allowed on all tentatively suitable lands with minimum restrictions for visual quality, wildlife habitat, and diversity. As a result, the timber and range outputs in the first three decades are the highest of any alternative, while visual quality, wilderness and roadless assignments, wildlife diversity, water quality, and fish habitat are the lowest of any alternative. Alternative A is the most expensive to implement in terms of discounted costs because it has the largest timber and road construction program early in the planning period. However, it is the cheapest alternative to implement in terms of foregone values because the additional costs are more than offset by additional timber benefits. It is the most economically efficient alternative because the objectives allow for the most efficient timber harvest schedule. The only opportunities to improve efficiency are to lower the first decade timber and range outputs.

The foregone value of implementing Alternative A rather than Benchmark K is \$58 MM. The discounted costs are 11 percent higher in Alternative A while the benefits are 7 percent lower.

The increased costs and foregone benefits are a consequence of increasing the first decade green sawtimber harvest from the 160 MMBF level which maximizes PNV to 550 MMBF; increasing the visual quality from unacceptable modification to maximum modification; increasing the average livestock forage; and increasing dispersed and wilderness recreation management from the minimum to a moderate level.

The timber harvest, range, and visual quality objectives reduce timber benefits by \$31 MM and increase discounted timber management and road construction costs \$16 MM. These constraints shift the harvest of less valuable timber from decade 3 to decade 1: 40 percent of the harvest volume is from lodgepole pine habitat types and 37 percent is from the steep, sensitive land type which require aerial logging. In addition, 16,000 acres were identified as economically not suitable which were economically suitable in Benchmark K. Discounted recreation management costs increase \$8 million to improve the quality of dispersed and wilderness recreation. Since recreation management activities do not affect recreation use, the benefit values assigned to recreation use do not change because of the increase in costs.

Alternative B is the next cheapest alternative to implement in terms of discounted costs. The additional \$3 million in timber management costs required to implement Alternative A more than offset the additional \$6 million in discounted timber benefits. The net timber program in decade 1 is worth less in Alternative A because more timber is cut but the losses are made up by the end of the third decade.

The timber program in Alternative A is slightly more economically efficient than the timber program in Alternative B because lower visual quality objectives allow more concentrated timber activities in the more valuable timber. The increase in efficiency due to lowering visual quality objectives are somewhat offset by increasing the timber harvest and livestock forage production.

Alternative A has a more efficient land assignment and output schedule than Alternative F because of fewer constraints which preclude timber harvest in suitable timberlands, and which disperse harvest activities over the Forest. Discounted costs are 40 percent higher and PNV is 16 percent more in Alternative A. Part of the additional expense is due to a larger timber program and part of the additional cost is for increasing road maintenance, fire protection, and general administration. Even though the land assignment and output schedule of Alternative A is more efficient than Alternative F, some of the potential increase in PNV is traded off to increase timber harvest in the first decade, and to reduce the risk of resource damage associated with timber harvest, road maintenance, and fire.

Managing the Forest for a high level of timber and forage outputs can be very economically efficient as long as nonmarket resources are managed at a very low level. Maximizing timber harvest in the first decade to increase local employment can be expensive, but the expense can be partially offset by an assignment and schedule with few constraints. Large investments required in the first decades are more than offset by large returns in decades 3 to 6. The major tradeoffs associated with focusing management on timber and forage production are a modified landscape, no elk security areas, few roadless recreation areas, low water quality and reductions in fisheries habitat and population potential.

#### b. Alternative B

Alternative B provides high levels of market resources with some consideration for nonmarket outputs. It is similar to Alternative A except management objectives shift slightly from timber and range production to visual quality, roadless and wilderness designation, and wildlife habitat. Timber production is precluded from 3 percent of the tentatively suitable land base to recommend 50 M acres for wilderness. Timber harvest is restricted on an additional 15 percent of tentatively suitable timberland for visual quality and wildlife habitat objectives. Alternative B is the second most expensive alternative in terms of discounted costs because it has the second largest timber and road construction program. However, it is the second cheapest alternative in terms of foregone value because additional costs are more than offset by additional timber benefits. Economic efficiency could be improved by lowering the timber harvest, or visual, wilderness, and wildlife habitat objectives.

The foregone value of implementing Alternative B rather than Benchmark K is \$63 million. Discounted costs are 11 percent higher while discounted benefits are 9 percent lower. The increased costs and foregone benefits are a consequence of increasing the first decade greem sawtimber harvest from the most efficient level to 480 MMBF, increase visual quality objectives from unacceptable modification to between maximum modification and the inventoried level, increasing dispersed and wilderness recreation management from the minimum to a moderate level, and precluding timber management from 17 M acres. The timber harvest, visual quality, and wilderness objectives reduce the discounted timber benefits \$38 million and increase the discounted timber and road construction costs \$14

million. The consequences are due to more expensive timber harvested in the first 3 decades, and less timber available over the planning period. The total suitable timber base decreases from 586 to 569 M acres. Discounted recreation costs increase \$8 million to improve the quality of dispersed and wilderness recreation. Since recreation management activities do not affect recreation use, the benefit values assigned to use do not change because of the increase in costs.

Alternative C is the next cheapest alternative in terms of discounted costs. The additional \$5 million in Alternative B is needed to produce more timber and build more roads. This cost is more than offset by an increase in timber benefits of \$23 million. The additional timber costs are somewhat offset by a reduced level of recreation management, primarily investments in trails. Alternative B is more economically efficient than Alternative C despite the increase in discounted costs because 10 percent more land is available for timber production, and harvest activities are more dispersed on elk winter range.

Alternative A is the next cheapest alternative in terms of PNV. The additional \$5 million in foregone PNV is due to dispersing timber management activities for visual quality objectives and precluding timber management from 3 percent of tentatively suitable timberland. The reduction in economic efficiency due to increasing visual quality objectives and increasing wilderness are somewhat offset by decreasing the timber harvest and livestock forage outputs in the first decade.

Alternative B has a more economically efficient land assignment and output schedule than Alternative F because of fewer constraints on the timber program: an additional 116 M acres are available for timber management, and 35 M less acres are not managed for visual quality. Some of the potential increase in PNV is traded off to increase timber harvest in the first decade and increase levels of timber sale preparation and administration, fire protection, road maintenance, and general administration. In the first decade, Alternative B will cost 30 percent more and return 130 percent more in terms of undiscounted costs and benefits. Implementing Alternative B instead of Alternative F will improve the PNV \$43 million or 40 percent.

Managing the Forest for a high level of timber output can be economically efficient as long as nonmarket resource are managed at a fairly low level. Providing a high level of timber harvest in decade 1 to provide local employment can be expensive but the expense can be partially offset by allowing an assignment and schedule with few constraints. Large investments required in the first decades are more than offset by large returns in decades 3 to 6. The major tradeoffs associated with focusing management on timber production are a modified landscape, no elk security areas, few roadless recreation areas, low water quality and reductions in fisheries habitat and populations.

## c. Alternative C

Alternative C provides high levels of market resource with some consideration for nonmarket resources. It has the same objectives as Alternative B except more area is assigned to roadless or wilderness, and trails are maintained at a higher level. Timber production is precluded from 12 percent of tentatively suitable timberland to provide 215 M acres of roadless area and new wilderness. Timber harvest is restricted on an additional 14 percent for visual quality and

wildlife habitat objectives. Alternative C is the third most expensive alternative in terms of discounted costs because it has the third largest timber and road construction program. It is also the third cheapest alternative in terms of PNV because the additional costs are more than offset by additional benefits. Economic efficiency could be improved by lowering the timber harvest, or visual, wilderness, roadless, and wildlife habitat objectives.

The foregone value of implementing Alternative C rather than Benchmark K is \$81 million. The discounted costs are 8 percent higher while the discounted benefits are 15 percent lower. The changes in benefits and costs are due to shifting timber harvest into the first decade which limits the total harvest over the planning period, and to high levels of recreation management. Net discounted timber value is reduced 56 percent from Benchmark K because of harvesting 460 MMBF in the first decade, restricting timber activities between the inventoried visual quality objective and maximum modification, and assigning acres to wilderness or roadless. Discounted recreation costs increase \$14 million to improve the quality of dispersed and wilderness recreation. Since recreation management activities do not effect recreation use, the benefit values assigned to use do not change because of the increase in costs.

Alternative E1 is the next cheapest alternative in terms of discounted costs. The additional \$7 million in Alternative E1 is to produce more timber and build more roads. Alternative C harvests 20 percent more timber and builds 24 percent more roads over the 150-year planning period. The increased cost is more than offset by an increase in discounted timber benefits of \$45 million. This change in timber benefits and costs is because timber harvest is less constrained in Alternative C by visual quality, wildlife habitat, and roadless/wilderness designation. In addition the discounted net value of recreation is \$4 million greater in Alternative C because the benefits are greater due to more wilderness, and the costs are less due to fewer investments.

Alternative F is the next cheapest alternative in terms of PNV. Alternative C has a more economically efficient land assignment and output schedule than Alternative F because of fewer constraints on the timber program: an additional 64 M acres are available for timber production and 42 M fewer acres are not managed for a high level of visual quality. However the gains in efficiency are more than offset by increased levels of timber sale preparation and administration, fire protection, road maintenance, and general administration. The net cost of changing from Alternative F to Alternative C is \$22 million.

The difference in PNV between Alternative B and C is from precluding an additional 68 M acres from timber production, improving wildlife habitat, and increasing the level of trail management. Alternative C costs \$5 million less in terms of discounted costs because the increase in recreation expenditures are more than offset by a decrease in timber and road construction costs. The reduction in cost is more than offset by a reduction in timber benefits of \$23 million. The consequence of increasing wilderness and wildlife habitat objectives from Alternative B to C is to reduce the available timber volume and the net discounted value of the remaining volume. The costs of these constraints are partially offset by lowering the first decade timber volume from 480 to 460 MMBF. The net effect is an increase in discounted net timber value in decade 1 of \$2 million and a reduction of \$13 million in decades 2-6. The suitable timber base is reduced from 569 M acres to 518 M acres. In addition to changes in the value of the timber resource, the net discounted value of the recreation re

source is \$6 million less in Alternative C than B because the benefits of increasing wilderness designation are more than offset by increasing the cost of trail management objectives.

The cost of providing a fairly high level of timber increases with the increase in nonmarket resource objectives because constraints which provide for nonmarket resources limit the returns to the timber program in decades 3 through 5. The benefits of accepting the direct costs and foregone benefits of Alternative C are to preserve the highest quality areas for roadless or wilderness, to protect some cover/forage on winter range, to protect some visual quality along major travel corridors, to protect some fisheries habitat along major streams, and provide a fairly high potential for employment in the local forest products industry.

#### d. Alternative E

Alternative E provides moderate levels of both nonmarket and market resources. Timber harvest is precluded from 23 percent of tentatively suitable timberland to provide 286 M acres of roadless, wilderness, and elk security. Timber harvest is restricted on an additional 18 percent to provide a moderate level of visual quality, wildlife diversity, and riparian protection.

Consequently, timber harvest in the next 10 years is 45 percent of the maximum under nondeclining yield. Livestock grazing in the next 10 years is 90 percent of the potential.

Alternative E is the fifth cheapest alternative to implement in terms of discounted costs because of slightly smaller than average timber and roads costs. It is the fourth most expensive alternative to implement in terms of PNV because foregone timber values more than offset the savings in timber and road costs. Foregone timber values are due to roadless, wilderness, and elk security assignments; wildlife and fish habitat constraints, and visual quality objectives.

The foregone value of implementing Alternative E rather than Benchmark K is \$110 million. Alternative E is only \$5 million more expensive in terms of discounted costs; however, the costs are higher in recreation and lower in timber and road construction. The discounted benefits of Alternative E are \$105 less than Benchmark K because future timber harvest is constrained. Precluding timber management from 23 percent of the tentatively suitable timberland base, dispersing timber harvest activities over the landscape, and maximizing timber harvest in the first decade account for 83 percent of the foregone value. The timber resource has 38 percent of the value in Benchmark K. Increasing recreation and trail management from a minimum to moderate level accounts for the remaining 16 percent of the foregone value.

Alternative H is the next cheapest in terms of discounted costs. The economic consequences result from improved visual quality, riparian habitat, wildlife habitat, and timber harvest objectives. The cost of these objectives are partially offset by increasing the suitable timber base. The discounted costs of Alternative E are \$16 million more than Alternative H because the timber management and road construction programs are larger.

The PNV of Alternative E is \$6 million less than Alternative H because increased costs are partially offset by increased timber benefits. In Alternative E, the increases in timber and road construction costs in the first 20 years are not offset by the increase in timber benefits in the first 60 years. The economic efficiency gains from harvesting timber on an additional 80 M acres of tentatively suitable timberland are limited by the constraints which disperse harvest activities to meet visual quality, riparian, wildlife habitat, and timber harvest objectives.

Alternative E has a more economically efficient land assignment and output schedule than Alternative F, but the efficiency improvements are offset by increased costs for recreation, timber, road construction, fire control, general administration, and road maintenance. If Alternative E is implemented, the annual costs in the first decade will increase from the current level of \$8.0 million to \$9.0 million. The discounted costs for 150 years will increase from \$191 million to \$213 million.

The potential to improve economic efficiency of the timber program by changing from Alternative F to Alternative E is foregone to reduce the risk of resource damage by increasing sale preparation and administration.

Managing to marginally meet public issues of visual quality; wilderness, roadless, and elk security areas; diversity, water quality, and fish will provide for moderate levels of nonmarket benefits for Forest. The tradeoffs are the direct costs of recreation management and the foregone timber harvest opportunities which reduce the long-term investment value of the Forest and local employment opportunity.

#### e. Alternative E1

Alternatives E and E1 provide for moderate levels of both market and nonmarket resources. However Alternative E1 increases the first decade harvest by departing from nondeclining flow. Like Alternative E, timber harvest is precluded from 23 percent of tentatively suitable timberland to provide 286 M acres of wilderness, roadless, and elk security areas. Timber harvest is restricted on an additional 18 percent to provide moderate levels of visual quality, wildlife diversity, and riparian protection. Departing from nondeclining flow allows for 20 percent more volume to be harvested in decade 1.

Alternative E1 is the fourth most expensive alternative in terms of discounted costs because of larger timber and road construction programs. It is the second most expensive alternative in terms of PNV because the above average costs are not offset by additional benefits. The economic consequences reflect the tradeoffs of providing moderate levels of nonmarket outputs and moderate timber volume in the first decade.

The foregone value of implementing Alternative E1 rather than Benchmark K is \$121 million. The discounted costs are \$11 million more for Alternative E1 because increases in recreation costs are not offset by the reductions in timber and road construction costs. Eighty-four percent of the foregone value is from timber values due to early harvest of less valuable timber, precluding harvest from 23 percent of tentatively suitable timberland, and dispersing harvest activities over the landscape. The timber resource has a net value which is 31 per

cent of the value in Benchmark K. Increasing recreation and trail management activities from the minimum to moderate level accounts for 14 percent of the foregone value.

Alternative G is the next cheapest alternative in terms of discounted costs. The additional \$7 million required to implement Alternative E1 is for recreation management, timber management, and road construction. Even though the two alternatives have similar costs, Alternative G is more efficient in terms of PNV. Alternative E1 has discounted benefits the same as Alternative G.

Alternative G is the next cheapest alternative to Alternative E1 in terms of PNV. The additional \$6 million net value is foregone because additional expenditures are not totally offset by additional benefits. The timber resource is \$12 million less valuable in Alternative E1 than G because 23 percent more volume is cut in the first decade and 3 percent less timberland is available. The decade 1 net timber value is less in Alternative E1 even though more timber is cut because more commercial thinning, shelterwood cutting, selection cutting, and harvest in lodgepole pine habitat types is required.

The foregone value in the timber program is somewhat offset by increasing the net value of the recreation resource \$7 million by reducing recreation investment from a high to moderate level.

Alternative E1 has a slightly more economically efficient land assignment and output schedule than Alternative F, but the efficiency improvements are offset by increased costs for recreation, timber, road construction, fire protection, general administration, and road maintenance. If Alternative E1 were implemented, the annual costs in the first decade will increase from the current level of \$8.0 million to \$9.0 million. The discounted costs will increase from \$191 million to \$221 million.

The cost of shifting timber harvest from the third to the first decade is defined by comparing the timber benefits and costs of Alternative E1 and E. Twenty percent more volume is harvested in decade 1 in Alternative E1 and 10 percent less volume is harvested in both decades 2 and 3. Because less valuable timber is cut, the timber return for the first decade is the same as in Alternative E. Because more expensive timber is cut early in the planning period before stumpage values have appreciated, the discounted net timber values of Alternative E1 are 18 percent or \$10 million less than Alternative E.

Managing for a moderate level of visual quality; wilderness, roadless, and elk security area; diversity, water quality, and fish; and a high level of timber harvest is expensive in terms of direct costs and foregone investment opportunities. The primary economic tradeoff of Alternative E1 is foregone timber values due to harvesting a high level of timber, dispersing harvest activities over the Forest, and precluding harvest from roadless areas.

# f. Alternative E2

Like Alternative E, Alternative E2 provides moderate levels of both nonmarket and market resources. However, Alternative E2 is more responsive to fisheries and water quality issues. Timber harvest is precluded from 33 percent of the tentatively suitable timberland. This precluded land provides 162 M acres of roadless, wilderness and elk security.

Timber harvest in the next 10 years is 95 percent of the maximum under nondeclining yield. Livestock grazing in the next 10 years is 75 percent of future potential.

Alternative E2 is the second cheapest alternative to implement in terms of discounted costs because of slightly lower timber costs and much lower road costs. It is the sixth most expensive alternative to implement in terms of PNV because foregone timber values more than offset the savings in timber and road costs. Foregone timber values are due to roadless, wilderness and elk security assignments, wildlife fish habitat and sediment reduction activities, and visual quality objectives.

The foregone value of implementing Alternative E2 rather than Benchmark K is \$107 million. Alternative E2 is \$17 million less expensive in terms of discounted costs. The difference is primarily in road construction, with Alternative E2 \$20 million less expensive than Benchmark K. The discounted benefits of Alternative E2 are \$124 million less than Benchmark K because future timber harvest is constrained. Thus, most of the foregone value is due to timber values, resulting from dispersing timber harvest activities over the landscape and increasing timber harvest in the first decade.

Alternatives F and H are the next cheapest in terms of PNV foregone. Reduction in PNV with Alternative E2 results from increased visual quality, riparian habitat, wildlife habitat and timber harvest objectives. The discounted costs of Alternative E2 are the same as Alternative F and \$6 million less than Alternative H. Discounted benefits of Alternative E2 are \$4 million less than Alternative F and \$10 million less than Alternative H. The PNV of Alternative E2 is \$4 million less than Alternatives F and H because the lower costs of E2 are are more than offset by lower benefit values.

If Alternative E2 were implemented, the annual costs in the first decade will decrease from the current level of \$8.1 million to \$7.5 million, largely because of reduced road construction.

Managing to meet public issues of visual quality, roadless, wilderness, elk security, fishery habitat, and fish populations and water quality will provide for moderate levels of nonmarket benefits for the Forest. The economic tradeoffs of Alternative E2, similar to Alternative E, are the direct costs of recreation management and the foregone timber harvest opportunities because of scheduling restrictions which reduce the long-term investment value of the Forest.

#### g. Alternative F

Alternative F provides moderate levels of market outputs and the potential for moderate levels of nonmarket outputs within the expenditure levels of 1980 to 1982. These expenditure levels lower nonmarket resource management because costs are primarily constrained in recreation, fire control, road maintenance, and general administration. The expenditure constraint is unique to Alternative F. Timber harvest is precluded from 23 percent of tentatively suitable timberland for roadless, wilderness, and elk security; and timber management is constrained on an additional 21 percent for visual and wildlife habitat objectives. Alternative F is the third cheapest alternative in terms of discounted costs because the constraint on spending reduces recreation, road maintenance,

fire protection, and general administration costs below the level of any alternative except J. Alternative F is the fourth cheapest in terms of PNV. These cost decreases will not reduce recreation use or timber harvest. The expenditure constraint does not affect discounted benefits.

The foregone value of implementing Alternative F rather than Benchmark K is \$103 million. The discounted costs are \$17 million less and discounted benefits are \$120 million less. Alternative F is cheaper to implement in terms of discounted costs for road maintenance, fire control, and general administration, and because the expenditure constraint reduces these costs below the standards in the management prescriptions.

Timber management and road construction costs are cheaper because the timber program is smaller. Thirty-four percent less volume is harvest and 44 percent fewer miles of road are constructed because of a smaller timberland base and constraints to disperse timber harvest. The net discounted timber value 40 percent of the value in Benchmark K. In Alternative F, suitable timberland is 450 M acres. Finally, recreation costs are higher in Alternative F to increase dispersed and wilderness management from the minimum to moderate level. Because the recreation management level does not influence recreation use or the assigned benefit values of recreation, the net value of recreation is less in Alternative F.

The cost of providing a moderate level of market and nonmarket outputs can be partially offset by reducing the expenditures which are not tied to resource outputs: primarily road maintenance, fire control, and general administration. The tradeoffs of increasing efficiency with expenditure constraints are the increased risk of resource damage, reduced road construction, and inability to address issues and concerns.

Alternative E is the next cheapest alternative to Alternative G in terms of both discounted costs and PNV. The economic consequences of implementing Alternative G instead of Alternative E result from a slight shift from timber to recreation and wilderness management. The timber and road construction programs are cheaper and more efficient in Alternative G. In Alternative E, an additional \$8 million is spent primarily in the first 20 years which is not totally offset by the increase in benefits of \$6 million in decades 3 to 6. The timber resource is less valuable in Alternative E because reducing the visual quality objective does not offset the cost of increasing roadless/wilderness designation, increasing riparian area protection, and increasing shelterwood cutting. Scheduling slightly more volume in a more dispersed pattern reduces the efficiency. However, the net gain of \$2 million in timber values in Alternative G is more than offset by loss in net recreation values of \$7 million. This loss is caused by increasing recreation management and investments from the moderate to high level. Because the increase in recreation activities affect recreation quality instead of number of users, the cost increase does not influence recreation benefits. The total economic effect of implementing Alternative G instead of E is to increase discounted costs \$0.4 million and reduce PNV \$4 million. increase in recreation expenditure is moderated by a more efficient timber program.

Alternative G provides for a high level of nonmarket resources and a moderate level of market resources. Managing for a high level of visual quality, wilderness and roadless, elk security, diversity, water quality, and fish populations

will provide for exceptional recreation quality and minimum change from the present situation to Forest uses as well as residents and visitors of the Bitterroot Valley. The tradeoffs of providing nonmarket resource are the direct cost of recreation management and the foregone timber harvest opportunities which reduce local employment opportunities and the long-term monetary value of the Forest.

#### i. Alternative H

In total, net timber values contribute only 40 percent of the value of the timber resource in Benchmark K. In addition, wilderness management costs are high in Alternative H meet objectives for recreation planning, wilderness management, and trail construction. Since these management activities do not affect recreation use, the assigned benefits are not effected by increased costs. The net recreation value in Alternative H contributes 92 percent of the value of the recreation resource in Benchmark K.

Alternative J is the next cheapest alternative to Alternative H in terms of discounted costs. These alternatives have similar wilderness/roadless designation and management objectives. However, Alternative H allows for intense timber management on currently roaded lands while Alternative J provides a high level of riparian area protection, visual quality, and recreation management on roaded lands. Timber and road construction costs are \$19 million more in Alternative H. The increase in costs is more than offset by an increase in discounted timber values of \$53 million, which is due to more timber harvest and cheaper logging systems. The additional timber management costs of Alternative H are somewhat offset by lower recreation management and investment costs of \$8 million on roaded lands. Assigned recreation values are not affected by the change in cost because recreation use is not influenced by management activities. The total effect of investing an additional \$13 million in Alternative H rather than Alternative J is to increase the net value of the Forest \$40 million.

Managing for a high level of market outputs on 34 percent of the Forest and a high level of wilderness on 66 percent is expensive because of foregone investment opportunities of precluding timber management from potential wilderness and the direct cost of optimal wilderness management. The benefits are to provide high levels of elk security, wilderness, and fish habitat.

# j. Alternative J

Alternative J provides a high level of nonmarket resources and a low level of market outputs. Timber harvest is precluded from all of the tentatively suitable timberland which is presently roadless in order to provide the maximum wilderness. Timber harvest is also precluded from all of the suitable riparian area to provide maximum riparian area protection. In addition, timber harvest is restricted on 60 percent of the remaining suitable timber base to provide for a high level of visual quality, and wildlife diversity. The objectives which maximize wilderness designation, riparian area protection, visual quality, and diversity are the most limiting of any alternative and thus Alternative J is the most expensive in terms of foregone investment opportunities. However, it is the cheapest alternative in terms of discounted costs because the timber and road construction programs are the smallest.

Alternative E1 is the next cheapest alternative in terms of foregone investment opportunities. The PNV of Alternative J is \$20 million less than the PNV of Alternative E1. Most of the drop occurs in timber resource values. Timber and road costs are \$23 million more in Alternative E1, but the benefits are \$43 million more. The change in costs and benefits is due to lower timber harvest and less valuable timber harvested. The tentatively suitable land base is 30 percent less in Alternative J and the total volume harvested is 44 percent less. The net discounted timber value is 44 percent less. The average value is \$79/acre in Alternative J and \$100/acre in Alternative E1. The net value in recreation drops \$4 million because the increase in benefits from wilderness use is more than offset by increased costs. Finally, these reductions are partially offset by reducing nonseparable costs \$3 million including \$2 million for road maintenance.

Even though Alternative J is the cheapest in terms of direct cost, it is the most expensive in terms of foregone investment opportunities because timber investments have been constrained to maximize wilderness designation and provide a high level of visual quality, wildlife, and riparian habitat. These nonmarket resource objectives limit the value of the market outputs.

# IX. LANDOWNERSHIP PLAN

Ownership adjustment goals for each alternative are based on management prescription assignments. The ownership adjustment guideline for each management prescription is as follows:

Timber management - Avoid exchanges which reduce the availability of timber to Ravalli and Missoula Counties' wood products industry.

Riparıan - Maintain Bitterroot River bottom 40-acre parcel in public ownership.

Partial Retention, Roaded and Unroaded Retention - Consolidate land to benefit the visual resource so that visual management boundaries are more easily controlled and defined.

Roadless or Semiprimitive - Acquire inholdings but offer no semiprimitive lands.

Wilderness - Acquire available wilderness inholdings.

Corporate checkerboard landownership adjustment guidelines are as follows:

There does not appear to be justification for complete consolidation of ownership within the Bitterroot Forest.

Adjustments involving federal lands outside the Bitterroot Forest should remain open since public benefits are currently unknown.

Corporate adjustments would be desirable to meet or enhance some of the objectives of some alternatives.

Corporate checkerboard adjustments that would enhance the objectives of various alternatives are as follows:

Alternatives A and B - Assign all intermingled and adjacent Forest lands to the timber and range prescriptions. The objectives of these alternatives would not be enhanced by adjustment and would not interfere with corporate land management.

Alternatives E and E1 - Nearly all the National Forest adjacent land is assigned to the timber prescription. There is a small part of one Plum Creek Timber Company section adjacent to a roadless assignment which would enhance the roadless area slightly.

Alternative E2 - The adjacent Forest land is assigned to the Timber and Winter Range prescriptions. Except for some small pieces of winter range, the objectives of this alternative would not be enhanced by adjustment and would not interfere with corporate land management.

Alternative F - The winter range assignment could be enhanced by the acquisition of 1-1/2 sections on the western edge of the area. The remainder of the area is almost all timber assignment which would probably remain available for timber harvest under either ownership.

Alternative G - One and one-half sections on the western edge of the area would enhance the winter range assignment. One section in the northwest edge of the area would enhance elk security by adding to the unroaded retention assignment. The travel corridor visual assignments along Rye Creek and Sleeping Child Creek would be continuous and completely protected by acquisition of about 3 sections. There is part of one Plum Creek Timber Company section in the northeast corner which is adjacent to a roadless area. The addition of this piece would provide for locating the roadless area boundary on the ridge between Sleeping Child and Divide Creeks.

Alternative H - The visual, stream protection corridor along Rye Creek would be enhanced by the acquisition of about one or two sections in the southeast part of the area. The Sleeping Child roadless area would also be enhanced by the addition of most of section one in the northeast corner of the area. The remainder of the intermingled ownership area is assigned to the timber prescription.

Alternative J - The addition of about 4-1/2 sections of Plum Creek Timber Company land along visual corridors would enhance the partial retention and roaded retention assignments. A small piece of the northwest corner is on winter range and would enhance the winter range assignment. Section 1 and part of section 11 in the northeast corner are within the proposed wilderness boundary and should be acquired to protect the wilderness attributes.

# X. ENERGY CONSUMPTION

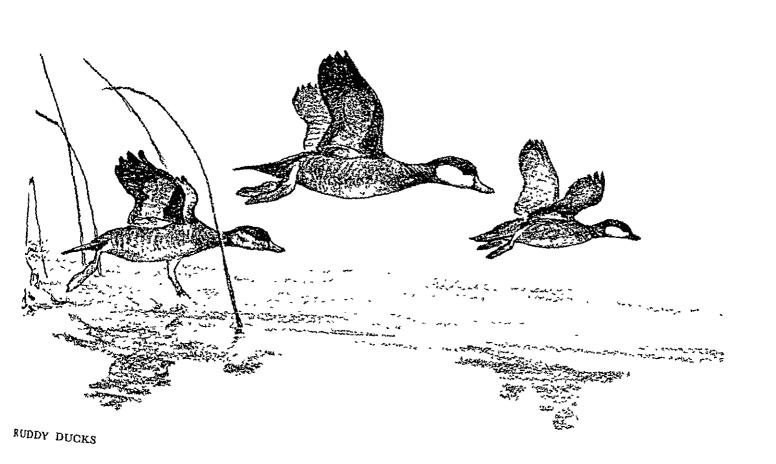
Energy consumption for each alternative was ascertained by multiplying Regional coefficients of energy use for various activities times 13 variable factors. Most of the factors were related to timber harvest volume, acres harvested, and road construction. Dispersed and developed recreation factors varied by RVD use and included energy expended by the user from home to recreation area or site.

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The Forest planning process (36 CFR 219.17) requires that areas which remain essentially roadless and undeveloped be evaluated for wilderness.

This appendix evaluates eleven roadless areas for wilderness potential. Seven areas are shared with adjacent Forests. The Bitterroot Forest has the lead responsibility for Allan Mountain, Blue Joint, Sapphire, Selway-Bitterroot and Stony Mountain roadless areas. The Beaverhead and Lolo Forests have the lead for the North Big Hole and Lolo Creek areas respectively. The Sleeping Child, Needle Creek, Swift Creek and Tolan Creek areas are completely within the Bitterroot Forest.

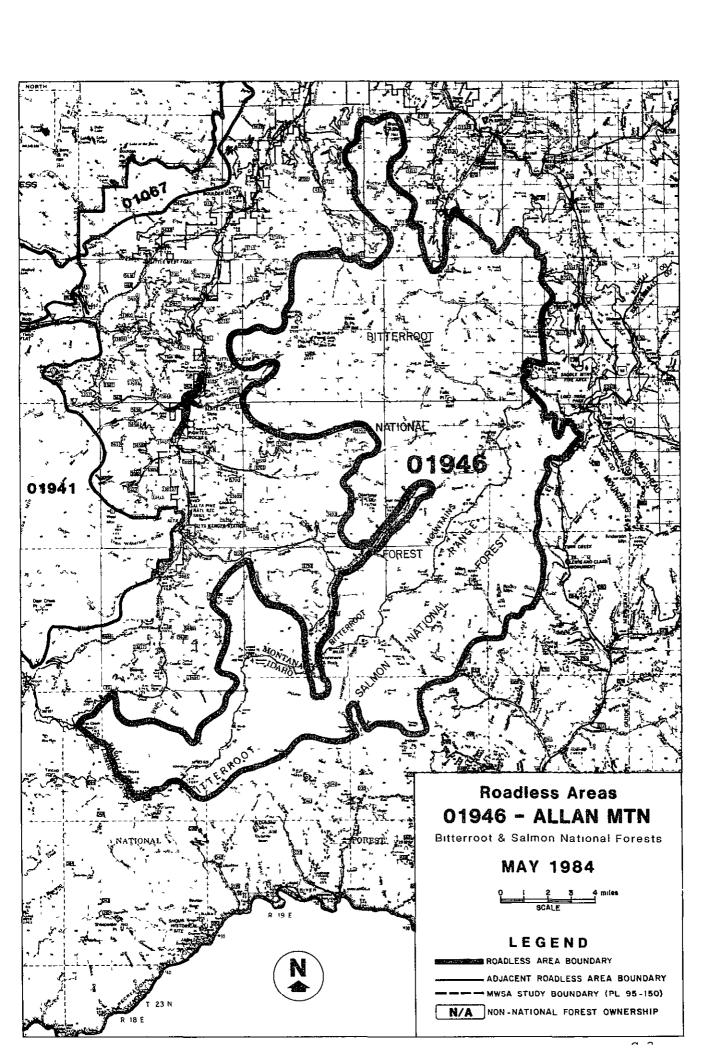
A few additions and changes have been made to this Appendix since the Draft EIS. About 5,000 acres in the Canyon Creek and Sweeney Creek areas have been added to the Selway-Bitterroot roadless area, due to cancellation or deferment of several timber sales. Alternative E2 has been added to the tables and discussions of alternatives. A summary of public comments on the Draft EIS has been added for each area, and the public hearings on the Sapphire and Blue Joint areas are briefly summarized under those sections.

Table C-1
Regional Wilderness and Proximity to Bitterroot Forest

Wilderness	General Incution	Proximity to Bitterroot Polest	Thousand Actes
An wonda-Pintler	Western Montana	less than 50 miles	159
Selway-Bitterioot	West central Montana	Less than 50 miles	1.089
·	East central Idaho	Less than 50 miles	251
Welcome Creek	Western Montana	less than 50 miles	28
SUBTOTAL	3 Areas	Less than 50 miles	1,527
Cospel Hump	Central Idaho	50 to 100 miles	206
Mission Mountains	Western Montana	50 to 100 miles	74
Rattlesnake	Western Montana	50 to 100 miles	33
Frank Church-River of No Return	Central Idaho	50 to 100 miles	2,239
Scapegoat	Western Montana	50 to 100 miles	240
SUBTOTAL	5 Areas	50 to 100 miles	2,792
Absaroka-Beartooth	South central Montana	100 to 200 miles	922
Bob Marshall	Western Montana	100 to 200 miles	1,009
Cabinet Mountains	Northwestern Montana	100 to 200 miles	94
Eagle Cap	Northeastern Oregon	100 to 200 miles	294
Gates of the Mountain	Central Montana	100 to 200 miles	29
Great Bear	Western Montana	100 to 200 males	287
Hells Canyon	West central Idaho	100 to 200 miles	84
Hells Canyon	Northeastern Oregon	100 to 200 miles	108
Lee Metcalf	South central Montana	100 to 200 miles	259
Red Rock Lakes	South central Montana	100 to 200 miles	32
Sawtooth	Central Idaho	100 to 200 miles	217
Wenaha-Tucaunon	Northeastern Oregon	100 to 200 miles	66
Wenaha-Tucaunon	Southeastern Washington	100 to 200 miles	111
SUBTOTAL	11 areas	100 to 200 miles	3,513
TOTAL	19 areas	Less than 200 miles	7,832

Table C-2
Regional Population Centers and Distance from Roadless Areas

Population (enter	-50 Miles Roadless Arens	or Less- Thousand Acres	51-100 Roadless Arens	Miles Thousand Acres	101∽20 Rondless Aren	O Miles Thousand Acres	201-300 Roadless Areis	Miles Thousand Acres
Spokane, WA	0		0	0	5	2/10	6	160
Boise, ID	ō	0	0	0	5	290	6	110
Pocatelio, ID	ō	Ō	0	0	á	0	11	400
Missoula, NT	3	155	8	245	0	0	0	0
Great Falls, MT	ő	ñ	0	Ó	11	400	0	0
Billings, MT	ŏ	ō	0	0	0	0	11	400



# I. ALLAN MOUNTAIN ROADLESS AREA

# A. Description

This area is identified by numbers 01946 (Bitterroot Forest) and 13946 (Salmon Forest). RARE II numbers were L1YAG and 04946. Roadless area acreage is:

National Forest	Gross Acres	Net Acres
Bitterroot (Montana)	102,386	102,286
Salmon (Idaho)	50,981	50,981
Total	153,367	153,267

About two-thirds of this roadless area is in Montana and about one-third is in Idaho. Resource values are identified for the whole area, and state and Forest portions.

The Allan Mountain area is located in the southern end of Ravalli County in western Montana and the northern portion of Lemhi County in east central Idaho. It lies approximately 45 miles south of Hamilton, Montana, and 40 miles north of Salmon, Idaho.

Primary access is via U.S. Highway 93 which parallels the east side of the area and by the West Fork Road on the west. Various Forest roads leading from these roads serve trailheads which provide access to the interior. Thirty trails totaling about 150 miles provide for travel within the area. Four mining roads totaling 17 miles intrude into the area.

The area extends 28 miles from north to south with a width of up to 13 miles east to west. The area is shaped like a comma with a consolidated core area containing Overwhich Falls (Montana) at the north end and a tail running to the southwest. There are several appendages on the north and the southern portion is almost bisected by mining roads.

Elevations range from about 4,800 feet to 9,154 feet at Allan Mountain in Idaho. Approximately 60 percent of the area is above 7,000 feet. The Idaho portion drains into the Salmon River, the Montana portion into the Bitterroot River.

Topography is steep and generally rocky with shallow, sandy-loam soils. Drainage bottoms are narrow with steepened slopes rising to relatively narrow ridges in the Montana portion and wider, rounder ridges in Idaho.

The area is mostly forested except for peaks in the Allan and Piquett Mountain areas and at spots along the Montana-Idaho border. Lodgepole pine, subalpine fir and whitebark pine are the major tree species above 7,000 feet. At lower elevations, Douglas-fir, ponderosa pine, lodgepole pine, and Engelmann spruce prevail.

Ground cover varies with elevation and aspect but grouse whortleberry, pine-grass, beargrass, and elk sedge are common with bunchgrasses on south slopes at lower elevations. Large areas east of Piquett Mountain and in the Straight Creek drainages burned in 1917 and 1919 and some fairly large, grassy openings favored by wildlife were created.

Streams are small, cold, fast-flowing with gravelly, rocky bottoms and support a native fishery.

Current uses in the area are grazing, mineral exploration, and a variety of recreation activities.

# B. Analysis of Wilderness Suitability

#### 1. Wilderness Attributes

# a. Natural Integrity and Appearance

Mining, range management, and fire control activities are the primary impacts in the area. Most of the mining and range impacts are located on the Montana side. Mining activity includes dozer trails and prospect holes in the Overwhich Falls area. Stub roads and pads for core drilling have been reclaimed to approximate natural contours. The jeep trail from Road No. 5702 to Overwhich Falls primarily consists of wheel tracks with an incised portion near Overwhich Falls. Wheel tracks are healing naturally, but the incised portions will be evident for the foreseeable future. A short spur road has also been incised through unstable slopes a short distance down Overwhich Creek creating a permanent scar. Mining access road corridors in Hughes and Mine Creeks and Indian and McConn Creeks are outside the roadless area but are blemishes on an otherwise natural appearing landscape. Corridors in Mine and Indian Creeks almost bisect the southern portion of the roadless area.

On the Montana side, evidence of range activities are fences, stock water tanks, and a cabin in Warm Springs Creek. Cattle have created bare spots around salting grounds and watering areas. Removal of cattle and facilities would allow these areas to heal.

The most evident fire control impacts are the helispots which have been cut along ridgetops. In most cases, a gradual return of tree cover would heal these areas.

Man-caused impacts occur on less than 1 percent of the roadless area with most near the center in the vicinity of Overwhich Falls. These would be evident to users when onsite. Overall, the area is natural appearing.

# b. Opportunities for Solitude

The size of the core area and topography around Overwhich Falls offer excellent opportunities for solitude. This opportunity decreases in the southern portion along the state border due to its long, narrow configuration, and the greater opportunity to view man's activities because of midslope boundaries. Lower slopes leading away from this portion are roaded and timber has been harvested.

Solitude opportunities are also excellent on the Idaho side in the vicinity of Allan Mountain. Here the mountainous region and steep drainages allow for escape from the timber harvest and roads on adjacent lands. Most of the appendages offer few opportunities for solitude.

# c. Primitive Recreation Opportunities

The area is well-suited to primitive types of recreation. The existing trail system is well-maintained and suitable for foot, horse, and trailbike travel. Some opportunities exist for cross-country travel and water is available throughout the area. Opportunities for high-risk activities such as rock climbing are rare.

#### d. Other Features

Subalpine larch stands on Allan Mountain represent the southern limit of this tree species.

Overwhich Falls, while carrying a relatively small volume of water, is spectacular. The geologic processes which led to Overwhich Creek cutting back through erosive materials and capturing the upper reaches of Fault Creek are significant.

High scenic values exist in the area around Allan and Piquett Mountains. Important cultural resources include a portion of the historic Southern Nez Perce Indian Trail and remnants of Forest Service, miner and trapper cabins scattered through the area.

# 2. Manageability and Boundaries

The area was inventoried and evaluated for wilderness in the 1979 RARE II (Roadless Area Review and Evaluation) Final Environmental Impact Statement. The area was designated for nonwilderness uses. Since 1979 timber has been harvested and some roading has occurred. On the Bitterroot Forest, the effects of the activities have been minimal because most were in appendages that rate low in wilderness attributes or were at midslope adjacent to previous activity. On the Salmon Forest, area no longer meeting roadless criteria are associated with the two mining roads and mineral activity in Indian and McConn Creeks and timber sale activity in the northeast corner. The following adjustment in net acres has taken place since the RARE II inventory:

Adjustment	National Bitterroot	Forest Salmon	Total <u>Acres</u>
1979 RARE II inventory Timber activity and roads Refined acreage calculation 1983 roadless inventory	111,200	46,670	157,870
	-9,549	-691	-10,240
	+635	+5,002	+5,637
	102,286	50,981	153,267

Most of the current boundary is not on readily identifiable topographic features, but is defined by the upper limits of development in individual drainages. There are opportunities to move boundaries to topographic features to enhance wilderness attributes.

A large core area (45 percent of the roadless area) with the highest wilderness characteristics has been identified. It is enclosed by high ridgetops which screen out most off-area evidence of civilization and encompasses the upper reaches of Warm Springs, Slate, and Overwhich Creeks in Montana and Indian, Hughes, and Twin Creeks in Idaho. The core area has solitude and most of the highest primitive recreation values and special features. Much of the more productive timberland that is the most physically suited for development is excluded. However, areas of high mineral potential, particularly around Overwhich Falls, cannot be excluded without seriously compromising wilderness characteristics. Most oil and gas leases are outside the core area. Boundary changes would also eliminate some of the nonconforming mining uses that are around the periphery.

Separate wilderness boundaries could be identified for each state's portion. On the Montana side an area around Overwhich Falls is possible, and on the Idaho side, a smaller portion around Allan Mountain is possible.

# C. Availability for Wilderness

# 1. Resource Potential and Use

Table C-3 Allan Mountain Roadless Area Resource Potential and Use

		Fores	st	i		
Category	Unit	Bitterroot	Salmon	Total		
Gross area	Acres	102,386	50,981	153,367		
Net area	Acres	102,286	50,981	153,267		
Recreation						
Primitive	RVD's	0	0	C		
Semiprim. nonmotor.	RVD's	200	0	200		
Semiprim. motor.	RVD's	4,000	2,400	6,400		
Roaded natural	RVD's	400	100	500		
Wıldlife habitat				-		
Elk & deer						
Summer range	Acres	88,201	50,981	139,182		
Winter range	Acres	14,085	0	14,085		
Rocky mountain goat	Acres	3,000	5,000	8,000		
Bighorn sheep	Acres	0	0	C		
Fisheries streams	Miles	64	18	82		
Lakes	Number	5	1	6		
Fisheries lakes	Acres	30	15	45		
Water developments	Number	0	- 0	Ó		
Livestock range		_	_	-		
Current use	AUM's	419	0	419		
Suitable rangeland	Acres	2,823	0	2,823		
Current allotments	Number	_, <u>4</u>	Õ	-,,4		
Other suitable	Acres	Ó	Õ	ò		
Timber		•	Ŭ	J		
Tentatively suitable	Acres	64,976	36,335	101,311		
Standing volume	MMBF	570.9	187.0	757.9		
Corridors	<u></u>	2,047	_0,.0	101.0		
Existing/potential	Number	0	0	0		
Ineral potential		<del>-</del>	-	C		
Very high	Acres	19,789	0	19,789		
High	Acres	17,403	50,981	68,384		
Moderate	Acres	42,829	0	42,829		
Low	Acres	22,265	Ö	22,265		
Mining claims	Number	449	22	471		
Oil & gas potential		• • • •		114		
Very high	Acres	0	0	0		
High	Acres	Ö	Ö	ő		
Moderate	Acres	0	0	ő		
Low	Acres	102,286	50,981	153,267		
Leases	Number	7	0	-22, <del>-</del> 21		
Leased area	Acres	4,410	Ö	4,410		

# 2. Selected Resource Values

#### a. Recreation

Current use is light consisting of big-game hunting but includes hiking, backpacking, horseback riding, fishing, camping, and ski touring. Major attractions include trails and campsites along the major streams and lakes, Overwhich Falls, and geologic attractions in the vicinity. The State Line, Saddle to Piquett Mountain, Allan Mountain, and Butcherknife Ridge trails provide varied subalpine scenery. Use is concentrated in these areas.

#### b. Wildlife

Wildlife includes elk, Rocky Mountain goat, black bears, mule deer, moose, mountain lions, wolverines, martens, pileated woodpeckers, golden eagles, hawks, ravens, blue and Franklin grouse, cutthroat and brook trout, and smaller animals and birds that are typical of moderate to high elevation land. The area also provides security areas for game during the hunting season. The Idaho portion contains tributaries of five important anadromous fish streams, which are directly influenced by habitat conditions in these headwaters.

#### c. Water

This is a relatively high water-producing area. Annual precipitation ranges from 40 to 50 inches. Watershed conditions are generally excellent and water quality is high. Headwater streams are tributary to the North Fork and main Salmon Rivers and the East and West Forks of the Bitterroot River.

#### d. Livestock

A moderate amount of recreational horse use occurs during the fall big-game hunting season. Although the Indian Ridge cattle allotment extends into the roadless area, practically all use occurs outside. The remaining allotments are in Montana with use confined primarily to meadows bordering Warm Springs Creek and grassy ridgetops to the north of Saddle Mountain and Medicine Point.

# e. Ecology

Topography, aspect, elevation, and precipitation create ecosystems that are characteristic of local mountainous areas. Subalpine larch stands on Allan Mountain represent the southernmost limit of this species. Penstemon lemhiensis is considered vulnerable to extinction and may be present (Bosworth, 1984).

#### f. Timber

About 65 percent of the area is tentatively suitable for timber production. Unsuitable lands are concentrated at the highest elevations along the state line and prominent lateral ridges, in the vicinity of Allan Mountain and Piquett/Rombo Mountains, and on south- to west-facing slopes dispersed throughout the area. Potential productivity ranges from 20 to 84 cubic feet per acre per year. Lands of higher site quality and those most suitable for development, due to favorable topography, are generally found at the lower/warmer elevations.

# g. Minerals and Energy Resources

Information on geology and mineral deposits is not adequate for preliminary resource evaluation (Anderson, 1960; Staatz et al., 1980). Mineral potential is believed to be high or very high on about 55 percent of the area. The very high rating is near Overwhich Falls where some 400 claims have been located and core drilling of low grade copper has occurred. High ratings are also concentrated in Overwhich Creek and in the Idaho portion. No new data modifies the RARE II rating which was high for the entire Idaho side. Minerals recorded include copper, iron, barite, gold, thorium, and rare earths. The oil and gas potential is considered low. Oil and gas leases are confined to the northeast portion and are all in Montana.

#### h. Cultural

A branch of the Southern Nez Perce Indian Trail is believed to have traversed the southern portion near the state line. Sites are assumed to be near the trail; however, little is known about cultural sites within the roadless area.

#### 1. Land Use Authorizations

There are five outfitter permits in the Montana portion and three in Idaho.

# J. Non-Federal Lands

There are about 100 acres of privately-owned land along the exterior boundary in a tributary of Hughes Creek in Montana.

# k. Other Considerations

# (1) Fire

Fire occurrence is low to moderate. The potential for large, intense fires is moderate due to heavy accumulations of down fuels, particularly in lodgepole pine stands decimated by mountain pine beetles in the 1930's.

# (2) Insects and Disease

Insects and diseases are generally endemic; however, dwarf mistletoe reduces annual growth in some areas as does spruce budworm, a recurrent pest. There are areas of high-risk lodgepole pine that will become increasingly susceptible to mountain pine beetle attack.

# D. Need

1. Proximity to Other Designated Wildernesses and Population Centers

See Tables C-1 and C-2.

# 2. Contribution to the Wilderness Preservation System

Classification as wilderness would add ecosystems and wildlife species which are well-represented in existing wilderness. Climax species such as marten and pileated woodpecker would also benefit, as would unroaded security for big game.

# 3. Public Interest

No wilderness was proposed in either the Montana or Idaho congressional delegations' bills of 1984, nor has either governor recommended wilderness for any portion of the area.

In the 1983 roadless area public involvement on the Bitterroot Forest, there was little public support for wilderness; however, there was strong support for roadless management emphasizing wildlife needs and primitive recreation opportunities. Conversely there was also support for managing the area for nonwilderness uses due to snowmobiling, timber, grazing, and mineral potential. On the Salmon Forest, public involvement generated a relatively low level of response with opinion about equally divided between wilderness and nonwilderness.

In RARE II, 15 percent of the responses to the RARE II DEIS supported wilderness, 23 percent nonwilderness, and 62 percent further planning. Response favoring further planning came primarily from the Idaho Citizens' RARE II Alternative W. Response was similar for both the Montana and Idaho portions.

Legislative history for the Central Idaho Wilderness Act (P.L. 96-312) supported nonwilderness management for the entire area (H.R. 96-1126, Conference Report).

In the unit planning process, a large core area centering around Overwhich Falls was identified for roadless management. This designation was generally acceptable to concerned groups. The Salmon Forest was prepared to evaluate a complimentary management emphasis.

The majority of comments on the Bitterroot Forest Plan DEIS were opposed to any semiprimitive or wilderness designations. The primary reasons are to assure an adequate supply of logs to mills as a vital part to the Bitterroot's economy, and there is more than adequate existing wilderness. Most of these respondents did not mention specific roadless areas whereas those opposed to development did. Comments specific to this roadless area favored a roadless, semiprimitive designation to protect wildlife values or to provide for roadless, off-road vehicle use. The primary reasons are: it is not in the public interest to lose money on a timber road access program and put other resources at risk; there are high wildlife, watershed and recreation values; and roadless areas are becoming an increasingly scarce resource.

# E. Alternatives and Environmental Consequences

### 1. Management Emphasis by Alternative

Management prescriptions providing for roads have been grouped into a roaded management emphasis since roading will preclude wilderness in the long term. Management prescriptions that do not provide for roads, except for possible mineral entry, are identified under an unroaded management emphasis. Development such as timber sale activity would preclude wilderness in the short term, but not necessarily in the long term. The semiprimitive recreation emphasis will maintain the roadless character.

Table C-4 displays total acreage assignments by management emphasis and development by decade for each alternative. Table C-5 shows suitable timberland and mineral potential acreage by management emphasis and alternative. Those Salmon Forest alternatives that are similar have been matched with Bitterroot Forest alternatives.

Section E2 uses Bitterroot Forest alternative names such as Alternative A, but describes the entire roadless area.

Table C-4
Management Emphasis (Allan Mountain)
(thousand acres)

Management										Alt	ernatı	ve-			<b>-</b>				
Emphasis Bitt	erroot	A	В		С		E		E1		E2		F		G		Н		J
Salm	on	4	2		2		1:	2	12		12		1		1	0	2		11
Nonwilderness designation	15	3 3	145	1 :	٤45	1	153	3	153	3	153	3	153	3	116	6	73	7	
Roaded Emphasis	13	8 1	120	8	99	5	41	0	41	0	26	9	69	4	37	9	49	9	
Bitterroot Forest	•	7 1	78	0	56	7	32	8	32	8	18	7	22	4	28	7	7	1	
Salmon Forest	5	1 0	42	8	42	8	8	2	8	2	8	2	47	0	4	9 2	42	8	
Unroaded Emphasis		0		0		0		0		0	11	1	11	8	8	1		٥	
Bitterroot Forest		0		0		0		0		0	11	1	11	8	8	1		0	+
Salmon Forest		0		0		0		0		0		0		0		0		0	1
Semiprimitive recreation Emp	phasis 2	5 2	24	3	45	6	112	3	112	3	115	3	72	1	70	6	23	8	1
Bitterroot Forest	2	5 2	24	3	45	6	69	5	69	5	72	5	68	1	65	5	23	8	1
Salmon Forest		0		0		0	42	8	42	8	42	8	4	0	!	5 1		٥	4
Wilderness designation		0	8	2	8	2		0		0		0		0	36	7	79	6	152
Bitterroot Forest		0		0		0		0		0		٥		0		0	71	4	101
Salmon Forest		0	8	2	8	2		0		0		0		0	36	7	8	2	51
Area developed by																			
Decade 1	5	3 7	34	1	20	3	16	4	19	7	1	6	19	0	18	4	16	8	(
Bitterroot Forest	3	9 3	19	5	5	7	16	4	19	7	1	6	8	6	9	2	2	4	
Salmon Forest	1	44	14.	4	14	4		0		0		0	10	4	9	2	14	4	(
Decade 5**	15	3 3	144	9	99	3	41	0	41	0	31	9	85	2	51	2	49	7	
Bitterroot Forest	10	23	102	3	56	7	32	8	32	8	23	7	34	2	36	8	7	1	
Salmon Forest	5	1 0	42	6	42	6	8	2	8	2	8	2	42	8	14	4	42	6	
Area roadless in *																			
Decade 1	9	96	111	0 1	24	8	136	9	133	6	151	7	134	3	98	2	56	9	
Bitterroot Forest	6	3 0	82	8	96	6	85	9	82	6	100	7	93	7	93	1	28	5	(
Salmon Forest	3	66	28	2	28	2	51	0	51	0	51	٥	40	6	5	1	28	4	(
Decade 5**		0		0	45	6	112	3	112	3	121	3	68	1	70	6	23	8	•
Bitterroot Forest		0		0	45	6	69	5	69	5	78	5	68	1	65	5	23	8	(
Salmon Forest		0		0		0	42	8	42	8	42	8		0	5	1		0	(
Current roadless acres	15	3 3	153	3 1	53	3	153	3	153	3	153	3	153	3	153	3	153	3	153
Bitterroot Forest	10	2 3	102	3 1	02	3	102	3	102	3	102	3	102	3	102	3	102	3	102
Salmon Forest	5	1 0	51	0	51	0	51	n	51	٥	51	^	51	n	51	0	51	٥	51 (

<sup>\*</sup> Does not include wilderness designations

<sup>\*\*</sup> Values shown for Decade 1 are planned outputs and effects. Values shown beyond Decade 1 are projections of the outputs and effects expected if the alternatives were selected to continue beyond the first decade.

Table C-5
Suitable Timberland and Mineral Potential (Allan Mountain)
(thousand acres)

Vanagement										A	lter	natı	ve							
Emphasis Bi	tterroot	A		В		¢		E		E	1	E	2	F		G		Н		J
Sa	lmon	4		2		2		1	2	1:	2	1	2	1		1	0	2		1
Tentatively suitable land																				
Roaded emphasis		101	3	99	3	79	5	28	0	28	0	21	3	57	5	28	5	38	5	
Bitterroot Forest		65	0	65	0	45	2	21	5	21	5	14	8	22	2	19	8	4	2	
Salmon Forest		36	3	34	3	34	3	6	5	6	5	6	5	35	3	8	7	34	3	
Unroaded emphasis			0		0		0		0		0	5	5	3	8	7	7		0	
Bitterroot Forest			0		0		0		0		0	5	5	3	8	7	7		0	
Salmon Forest			0		0		0		0		0		0		0		0		0	
Semiprimitive recreation	emphasis		0		0	19	8	73	3	73	3	74	5	40	0	39	0	10	9	
Bitterroot Forest			0		0	19	8	43	5	43	5	44	7	39	0	37	5	10	9	
Salmon Forest			0		0		0	29	8	29	8	29	8	1	0	1	5		0	
Wilderness emphasis			0	2	0	2	0		0		0		0		0	26	1	51	9	100
Bitterroot Forest			0		0		0		0		0		0		0		0	49	9	64
Salmon Forest			0	2	0	2	o		0		0		0		0	26	1	2	0	36
igh mineral potential																				
Roaded emphasis		77	2	68	8	59	4	13	9	13	9	10	1	43	9	22	0	43	5	
Bitterroot Forest		26	2	26	2	16	8	5	7	5	7	1	9	5	1	7	6		9	
Salmon Forest		51	0	42	6	42	6	8	2	8	2	8	2	38	8	14	4	42	6	
Unroaded emphasis			0		0		0		٥		0	3	8	17	8	2	1		0	
Bitterroot Forest			0		0		0		0		0	3	8	5	6	2	1		0	
Salmon Forest			0		0		0		0		0		0	12	2		0		۵	
Semiprimitive recreation e	emphasis	10	9	40	9	20	3	74	2	74	2	74	2	26	5	27	4	9	0	
Bitterroot Forest		10	9	10	9	20	3	31	4	31	4	31	4	26	5	27	4	9	٥	
Salmon Forest			0		o		0	42	8	42	8	42	8		0		0		0	
Wilderness emphasis			0	8	4	8	4		0		0		0		0	36	6	35	5	88
Bitterroot Forest			0		0		0		0		0		0		0		0	27	1	37
Salmon Forest			0	8	4	8	4		0		۵		0		a	36	6	8	4	51

# 2. Impacts

a. Designation: Wilderness
Management Emphasis: Wilderness

Nearly the entire area is recommended for wilderness in Alternative J with recommendations of 5 percent in Alternatives B and C, 24 percent in G, and 52 percent in H. Recommendations would expand the wilderness system by creating a new wilderness. No part of the area is recommended for wilderness in the other alternatives.

Alternatives B and C preserve those lands with high wilderness attributes while minimizing effects on market outputs. Alternative G incorporates that portion of the area having the highest wilderness attributes, and H and J include additional lands with low attributes.

Timber production is precluded because of wilderness designation on 100 percent of the tentatively suitable timberland in Alternative J, 2 percent in B and C, 26 percent in G and 51 percent in H. All tentatively suitable timberland amounts to 11 percent of the total for the Bitterroot Forest and five percent for the Salmon Forest.

Wilderness classification precludes management for semiprimitive recreation in Alternative J and reduces the acreage available in Alternatives B, C, G, and H. Recreation use will continue to be dominated by hunting, fishing, and camping. Mechanized trailbake, snowmobile, and chain saw use would be prohibited.

Under this management emphasis, mineral exploration and development is fore-closed subject to valid existing rights. All land in this roadless area rated very high or high for mineral potential is withdrawn from entry in Alternative J. Ten percent is withdrawn in Alternatives B and C, and about 40 percent is withdrawn in G and H.

Nonpriced benefits and costs include:

- A natural level of visual quality is maintained.
- The wilderness system is expanded.
- A natural level of big-game forage and cover is maintained. Cover/forage ratios would be determined by natural events such as fire.
- Vegetation diversity tends toward old growth as modified by a more nearly natural role for wildfire.
- Old-growth dependent wildlife species are favored.
- Natural levels of watershed and fisheries are maintained.
- Local wood products employment decreases in Alternative G, H, and J, but should remain stable in B and C.

Economic and social effects vary depending on the amount of tentatively suitable timberland and area of high or very high mineral potential recommended for wilderness. The wood products and mining industries would not be supported by this emphasis. Alternatives G and J would probably result in the loss of jobs in both counties and H would result in a loss in Ravalli County. Wilderness could attract more tourism to the two counties and enhance outfitter activities. Publics interested in wilderness and primitive recreation opportunities would be supported.

# b. Designation: Nonwilderness Management Emphasis: Roaded

Prescriptions in this emphasis are range, winter range, partial retention, roaded retention, and riparian. Some land is assigned to this emphasis in all alternatives except J. The highest level is in A and B with about 80 percent of the roadless area and the lowest (excepting J) is in Alternative G at 28 percent.

Virtually all tentatively suitable timberland is available for timber management in Alternatives A and B, 78 percent in C, and 30-50 percent in other alternatives. High-value old growth is scheduled for early removal; however due to long rotations, old growth will be retained above the minimum level in partial retention, retention, and riparian prescriptions. Early harvest is also scheduled in lodgepole pine stands which blanket much of the area.

Roads and timber harvest will foreclose future consideration for wilderness by the end of the fifth decade; however, from 65 to 96 percent would remain roadless at the end of decade 1. The roadless character would be changed as roads reduce the naturalness and solitude of the area. Present semiprimitive recreation use would be disrupted as the recreation setting shifts to roaded.

Access for mineral and energy exploration is enhanced as the road system expands. Lands of very high and high mineral potential would be readily accessible in Alternatives A and B.

Transitory forage for livestock and wildlife is created by timber harvest.

Nonpriced benefits and costs for lands under this emphasis include:

- Visual quality will be at the lowest level (maximum modification) in Alternatives A, B and H, and the highest in Alternative G.
- Characteristics for future consideration as wilderness or semiprimitive recreation are foregone by the end of the fifth decade.
- Security cover for elk and other game will be greatly reduced in A, B, C, and H; however, road closures will mitigate this effect.
- Vegetative diversity tends towards younger age classes in A, B, C, E, and H, but retains a sizeable old growth component in others.
- Water quality is reduced, but mitigated by high road construction and maintenance standards.
- Local wood products employment increases significantly in Alternatives A, B, and C, remains at current levels in E and F, and declines in E2, G, and H.

Economic effects vary depending on the amount of land that is suitable for timber production and the degree of constraints for visual, wildlife, and watershed values. The greatest positive effect is for Alternatives A, B, and C where most tentatively suitable lands are retained in the timber base with few constraints. The wood products and mining industries would be supported. Publics favoring roadless or wilderness characteristics would not be supported; however, much of the area would remain like it is for another 10 years. Those publics desiring a semiprimitive recreation experience would have to shift use elsewhere. Outfitters could continue but hunting experience would be altered.

# c. Designation: Nonwilderness Management Emphasis: Semiprimitive Recreation

The emphasis includes some land in all alternatives except J. In Alternatives E, E1, E2, F, and G, 46 to 75 percent of the roadless area is assigned to this emphasis. In A and B only relatively large, high elevation blocks that are not suitable for timber production are assigned.

Except for possible mineral entry, roadless characteristics will be retained within a core area in Alternatives C, E, E1, E2, F and G, and the land will remain available for future wilderness consideration. The roadless character, naturalness and solitude would be maintained. Recreation use will continue to be dominated by hunting, fishing, and camping; trailbike, snowmobile, and chain saw use is compatible.

Current levels of livestock use would continue.

Big-game cover forage relationships will be determined by natural events but can be modified by prescribed fire.

Roads are not needed for surface management purposes but will be permitted for mineral activities where construction is justified on the basis of mineral showings or data and where it is the next logical step in development of the mineral resource. Roaded access would not be provided on 12 to 88 percent of those lands having high mineral potential.

Timber production is precluded by this management emphasis on 17 to 74 percent of the tentatively suitable timber base in this roadless area. No tentatively suitable land is assigned this emphasis in Alternatives A and B, and only isolated and intermingled suitable land in Alternative C. Tentatively suitable timberland with low product values or difficult access are assigned this emphasis in Alternatives E, E1, E2, F, and G.

Nonpriced benefits and costs include:

- A natural level of visual quality is maintained.
- The wilderness option is retained for future consideration.
- Near natural cover/forage ratios for big game are retained but may be modified by prescribed fire.
- Old-growth dependent wildlife are favored.
- Natural levels of watershed and fisheries are retained.
- The current mix of recreation is retained.
- Local wood products employment levels decrease in Alternatives E, E1, and E2; would remain stable in G; and would increase in A, B, C, and H.

Economic and social effects vary depending on the amount of tentatively suitable timberland in this emphasis. The effect is greatest in E, E1, E2, F, and G with no effect in A and B, and little in C. The wood products industry is not supported by this emphasis. Miners could continue to operate; however, costs would be higher without road access. Land would remain much like it currently is, thus supporting the current recreation mix, livestock grazing, and outfitters.

d. Designation: Nonwilderness
Management Emphasis: Unroaded

Land assigned to this emphasis is confined to Alternatives E2, F, and G, with 7, 16, and 5 percent of the roadless acreage respectively.

Timber harvest forecloses future consideration for wilderness by the end of the fifth decade; however, nearly all the area would remain roadless at the end of decade 1. The current level and mix of recreation use will be maintained. Five, 14, and 8 percent of tentatively suitable timberland is included in this emphasis in Alternatives E2, F, and G, respectively.

High-value old growth is scheduled for early harvest; however, due to long rotations significant old growth will be maintained. Economic efficiency of this emphasis is poor since timber harvest is limited to expensive aerial systems. Removal of large, old-growth ponderosa pine is efficient but harvest of other species may not be.

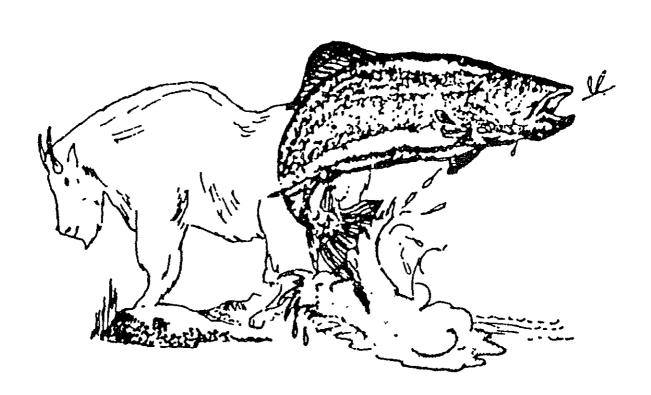
Mineral exploration and development is an appropriate use but would be difficult due to the lack of road access. Five percent of the lands rated as high mineral potential are included in this emphasis in Alternative E2, 20 percent in F, and 2 percent in G.

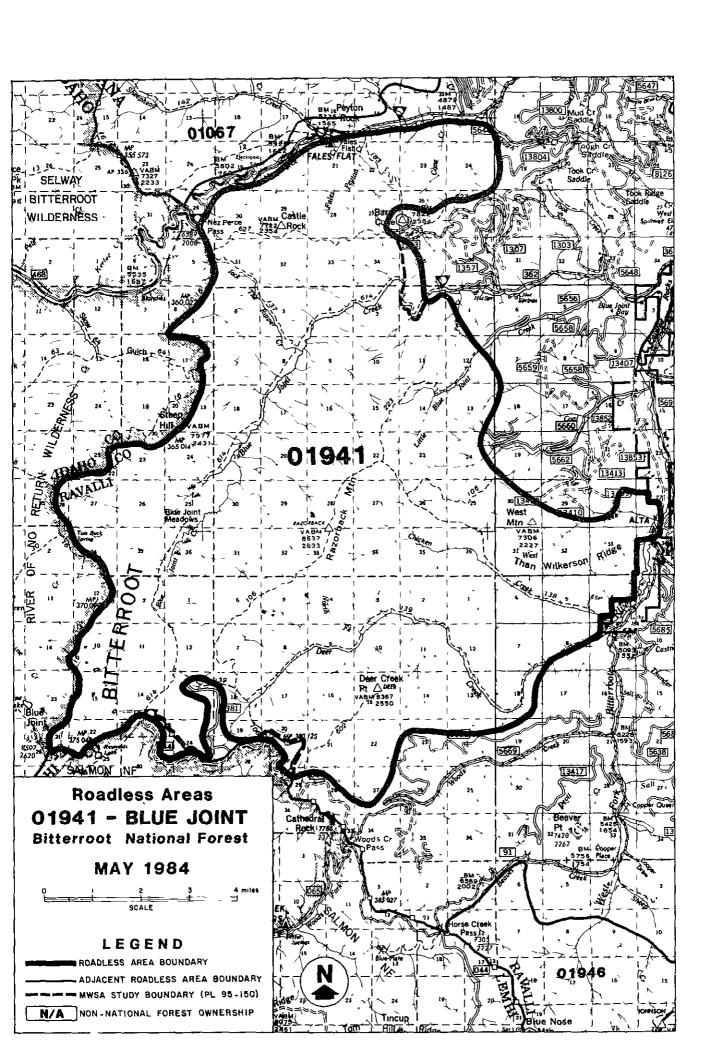
Transitory forage for livestock and wildlife is created by timber harvest.

Nonpriced benefits and costs include:

- A high level of visual quality will be retained.
- Future consideration for semiprimitive recreation will be retained.
- Vegetative diversity tends towards a balance in age classes including old growth.
- Water quality and fisheries remain at high levels.
- Unroaded big-game security areas are retained.
- Present recreation opportunities are maintained.

Timber is available to support the wood products industry. Mining is compatible with the emphasis although costs to the miners would be high without road access. The naturalness of the area would be impacted, but the roadless character would not be altered. Current semiprimitive recreation uses would be maintained and future consideration for wilderness would be possible.





# II. BLUE JOINT ROADLESS AREA

This area is identified by number 01941 (Bitterroot Forest) and 13941 (Salmon Forest). Roadless area acreage is:

National Forest	Gross Acres	Net Acres
Bitterroot	65,370	65,370
Salmon	490	490
Total	65,860	65,860

# A. <u>Description</u>

The roadless area is located in the Bitterroot Mountains in southwestern Ravalli County in western Montana with a small portion in Lemhi County, Idaho. Hamilton, Montana, is about 45 air miles to the north and Salmon, Idaho, is 40 air miles to the south. Access is provided at many points along the boundary by Forest roads which tie in with U.S. Highway 93, some 20 miles to the northeast. Within the area, a network of eight trails provides access along major drainages and ridgetops.

Blue Joint is a triangular-shaped area running 13 miles north and south and ranging in width from 4 to 13 miles. The west side borders the Frank Church-River of No Return Wilderness in Idaho for about 17 miles. The rest of the area is defined by roads; primarily the West Fork Road and extensions from it. The Nez Perce Road defines the northern boundary separating this area from the adjacent Selway-Bitterroot Wilderness and contiguous roadless lands. Likewise, the Reynolds Lake Road defines the southern boundary, separating the area from that portion of the Frank Church-River of No Return Wilderness in the headwaters of Reynolds Creek. Seventy-five percent of the boundary is well-defined by topographic features such as ridgetops or streams, and the remainder is at midslope above roads and/or timber harvest.

Elevations range from 4,900 to 8,600 feet. The area is generally a high, mountainous region with 50 percent of the area over 7,000 feet. Razorback Ridge and Razorback Mountain, dominant features, divide the area into northwest and southeast portions. Blue Joint Creek, by far the largest stream, drains the northwestern segment; and Chicken, Deer, and West Creeks drain the southeast. Stream bottoms are generally narrow with sideslopes rising steeply to narrow ridges. Slopes on more than one-half of the area are in excess of 60 percent, thereby confining most use to stream bottoms or ridgetops.

The area is forested except for the unique large meadows in the headwaters of Deer and Blue Joints Creeks and dry, south-facing slopes. At higher elevations rock rubble and grassy balds are common. Tree species are predominantly Douglas-fir and ponderosa pine on the warmer, lower elevation sites and lodge-pole pine on cooler sites at midslope. Near the top of the higher ridges, whitebark pine is a dominant species. Ground cover is primarily pine grass, snowberry, and ninebark at lower elevations and beargrass or grouse whortleberry on higher, cooler sites.

In the Blue Joint drainage, forest fires in the late 1800's burned over most of the area. Today, small lodgepole pine stands cover this portion contrasting with the rest of the area.

#### B. Analysis of Wilderness Suitability

#### 1. Wilderness Attributes

#### a. Natural Integrity and Appearance

Activities that have significantly altered natural processes are minimal and just inside the eastern and southeastern boundaries. These include all or portions of seven timber sale cutting units totaling about 170 acres and 3 miles of associated access roads. The boundary could be defined to exclude these impacts. There is a 3/4-mile fire road in the extreme headwaters of Blue Joint Creek, and about 1 mile of dozer trail in lower Blue Joint Creek.

These impacts are readily apparent to any visitor when onsite; however, the remainder of the area appears natural. The roads have permanently altered natural processes, but cutting units will recover to nearly natural conditions in 20-30 years.

#### b. Opportunities for Solitude

The northwest portion of the area is entirely enclosed by high ridges and provides outstanding solitude. This feeling is enhanced by the many miles of wilderness to the west and south. No development can be seen or heard.

Solitude is somewhat lower in the southeast portion. About 2 miles of road in Deer Creek, outside the area, form a roaded intrusion into the headwaters of that drainage. Distant views include roads and timber sale activity just outside the area.

Civilization appears close at hand along the northern and eastern boundaries and from that portion within Woods Creek. About 40 percent of the area provides outstanding opportunities for solitude, another 40 percent provides high to moderate opportunities, and 20 percent provides low opportunities.

#### c. Primitive Recreation Opportunities

These include hiking, big- and small-game hunting, fishing, and viewing a moderate diversity of vegetation and wildlife.

#### d. Other Features

Significant scenic attractions include two prominent landmarks, meadows in the upper reaches of Blue Joint and Deer Creeks, and wide panoramas viewed from the major divides. The landmarks are Castle Rock, the remnant of a volcanic plug, and a natural rock arch east of the confluence of Jack the Ripper and Blue Joint Creeks. Parts of the Southern Nez Perce Indian Trail traverse the Montana/Idaho ridge and Bare Cone Lookout is in the northern portion of the area. Several archeological sites are associated with the trail.

#### 2. Manageability and Boundaries

RARE II area A1941 comprises the roadless area. The following adjustment in net acres has taken place since the RARE II inventory:

Adjustment	National	Forest	Total
	<u>Bitterroot</u>	<u>Salmon</u>	<u>Acres</u>
RARE II inventory Added to wilderness (P.L. 96-312) Land added to inventory	126,500 -65,100	19,905 -19,415	146,405 -85,005
Refined acreage calculation	+3,970	+490	+3970
Current inventory	65,370		65,860

Approximately 85,000 acres have been designated wilderness (P.L. 96-312, establishing the Frank Church-River of No Return Wilderness). Boundary decisions excluded two parcels in Idaho from wilderness. These are contiguous with the Congressionally designated Blue Joint Wilderness Study Area (P.L. 95-150) in Montana and will be further evaluated for wilderness/nonwilderness uses in that process.

The Frank Church-River of No Return Wilderness is about 2,230,000 acres, bordering the west side of this area for about 17 miles. Boundaries are well-defined by topography along 75 percent of the perimeter. The remainder would be difficult to describe and locate on-the-ground since it is midslope, either passing through or lying immediately above roads and development. Roads and timber harvest in Coal Creek and Woods Creek would not be realistic to manage as wilderness. Eliminating these impacts would remove about 4,000 acres from consideration as wilderness and would place boundaries on recognizable topographic features. Most areas of high mineral potential could not be separated without seriously eroding wilderness characteristics. The area could be managed as an addition to the Frank Church-River of No Return or as a separate wilderness.

The area is entirely National Forest. Nonconforming uses consist of a minor amount of trailbiking, chain saws for clearing trails, and firewood cutting by hunters and campers. There are no contractual agreements or known statutory rights, and no oil/gas leases.

## C. Availability for Wilderness

#### 1. Resource Potential and Use

Table C-6
Blue Joint Roadless Area Resource Potential and Use

		Fores		
Category	Unit	Bitterroot	Salmon	Total
Gross area	Acres	65,370	490	65,860
Net area	Acres	65,370	490	65,860
Recreation				•
Primitive	RVD's	0	0	C
Semiprim. nonmotor.	RVD's	0	0	C
Semiprim. motor.	RVD's	1,300	0	1,300
Roaded natural	RVD's	200	100	300
Wildlife habıtat Elk & deer				_
Summer range	Acres	60,919	490	61,409
Winter range	Acres	4,451	0	4,451
Rocky mountain goat	Acres	400	Ö	400
Bighorn sheep	Acres	2,000	Ö	2,000
Fisheries streams	${ t Miles}$	51	0	51
Lakes	Number	0	0	ĺ
Fisheries lakes	Acres	0	0	C
Water developments	Number	0	0	C
Range				
Current use	AUM's	130	0	130
Suitable rangeland	Acres	1,172	0	1,172
Current allotments	Number	1	0	1
Other suitable	Acres	0	0	0
Timber				
Tentatively suitable	Acres	43,662	427	44,089
Standing volume	MMBF	409.4	1.2	410.6
Corridors		_		
Existing/potential	Number	1	0	1
Mineral potential				
Very high	Acres	0	0	C
High	Acres	26,413	0	26,413
Moderate	Acres	37,477	0	37,477
Low	Acres	1,480	490	1,970
Mining claims	Number	15	0	15
011 & gas potentíal				
Very high	Acres	0	0	C
High	Acres	0	0	C
Moderate	Acres	0	0	0
Low	Acres	65,370	490	65,860
Leases	Number	0	0	0
Leased area	Acres	0	0	0

#### 2. Selected Resource Values

#### a. Recreation

Current use is very light consisting primarily of big-game hunting but also includes day hiking, wildlife viewing, horseback riding, camping, and fishing. Major attractions include trails and campsites along the several larger streams and meadows. The State Line and Razorback Ridge Trails provide varied alpine scenery near the crests.

#### b. Wildlife

Wildlife includes elk; mule deer; bighorn sheep; moose; black bears; mountain lions; wolverines; pileated woodpeckers; golden eagles; hawks; ravens; blue, ruffed, and Franklin grouse; cutthroat, dolly varden, and brook trout; and a host of smaller animals and birds.

A unique wildlife resource is the indigenous bighorn sheep herd believed to be genetically pure, a rarity in the contiguous 48 States. Sheep use is concentrated along the northern boundary in the vicinity of Castle Rock, where rocky sections are used for lambing. This herd also inhabits the Selway-Bitterroot roadless area and the Selway Bitterroot Wilderness area to the north.

#### c. Water

This is a relatively high water-producing area. Stream runoff is estimated at 85,000 acre-feet/year, much of which is stored behind Painted Rocks Dam for irrigation and to maintain instream flows on the lower Bitterroot River. There are no structures, diversions, or ditches within the area.

#### d. Livestock

Approximately 130 animal unit months of grazing occur in meadows bordering the upper reaches of Deer and Blue Joint Creeks.

#### e. Ecology

Varied topography, aspect, elevation and precipitation contribute towards a moderate diversity of ecosystems. The area is on the fringes of the Selway-Bitterroot ecosystem which has been identified by the U.S. Fish and Wildlife Service as a possible grizzly bear recovery area. Penstemon lemhiensis is considered vulnerable to extinction and may be present (Bosworth, 1984).

#### f. Timber

About 44,000 acres, 65 percent of the area, is tentatively suitable for timber production. Unsuitable lands are concentrated at the highest elevations along the state line, Razorback Ridge, and south- to west-facing slopes dispersed through the area. Lower elevation, warmer sites are the most productive. Potential productivity on about 40 percent of the suitable land is low (20-49 cubic feet/acre/year) and the remainder is moderate (50-84 cubic feet/acre/year). The standing timber volume is 420 million board feet.

Currently, the area is not in the timber base nor does it contribute to the sales program.

#### g. Minerals and Energy Resources

The U.S. Geological Survey and Bureau of Mines have conducted a mineral survey and prepared a report for the area (Lund and others, 1984). Hardrock mineral potential is rated high for about 40 percent of the area in the vicinity of Bare Cone Lookout, Jack the Ripper Creek, Steep Hill, Deer Creek Point, and Lower Deer Creek. Forty claims have been located, of which 15 are lode and 25 placer. Examination of claims revealed only a few prospect pits and trenches with little or no evidence of production. Minerals of record include barite, cobalt, copper, gold, molybdenum, silver and uranium.

Traditional theory places the oil and gas potential as low. There are no oil and gas leases.

#### h. Cultural

A portion of the Southern Nez Perce Indian Trail traverses the ridge crest forming the divide between Blue Joint Creek and the Nez Perce Fork of the Bitterroot River. Several archaeological sites are associated with the trail. Little else is known about cultural remains.

#### 1. Land Use Authorizations

There are two outfitter permits.

#### Non-Federal Lands

The area is entirely National Forest.

#### k. Other Considerations

#### (1) Fire

Fire occurrence is low and the potential for large, intense fires is moderate due to heavy accumulations of down fuels, particularly in lodgepole pine stands that were decimated by mountain pine beetles in the 1930's. Heavy fuels are concentrated in the mid reaches of Chicken and Deer Creeks.

#### (2) Insects and Disease

Insects and diseases are generally endemic; however, dwarf mistletoe reduces annual growth in some areas as does spruce budworm, a recurrent pest. There are also areas of high-risk lodgepole pine that will become increasingly susceptible to mountain pine beetle attack.

#### D. Need

#### 1. Proximity to Existing Wilderness and Population Centers

See Tables C-1 and C-2.

#### 2. Contribution to the Wilderness Preservation System

Classification as wilderness would add streamside meadows which are rare in the northern portion of the Frank Church-River of No Return Wilderness. Other ecosystems and wildlife species are well-represented in existing wilderness. It would provide added width to the Selway-Bitterroot and Frank Church-River of No Return Wildernesses, which are relatively narrow in this vicinity. Climax forest wildlife such as marten and pileated woodpecker would benefit, and unroaded security areas for big-game animals would be provided. Habitat for the genetically pure bighorn sheep herd would be added.

#### 3. Public Interest

Most of the Montana portion is a congressionally designated wilderness study area (P.L. 95-150). No wilderness is proposed in the Idaho state bill (1984) and the Montana state bill (S. 2850) was silent on this area. In March 1986, the Montana Governor's Wilderness Advisory Committee recommended wilderness designation for about 42,500 acres. It includes the Forest's wilderness recommendation in Blue Joint Creek and additional land to the east in the headwaters of Deer, Chicken and West Creeks.

In the 1983 public involvement on roadless areas, the Blue Joint area was one of the priority areas with public support for wilderness classification. The area is valued because of its wildlife, especially hunting, fishing and elk security; scenic beauty, especially the high elevation meadows and uniqueness; and its proximity to existing wilderness areas. There is also concern that without a formal unroaded classification, this type of use would be short-lived.

The area is valued by other publics for nonwilderness uses because of snowmobile and motorcycle use, and timber and mineral potential. A typical concern is the need for additional acres developed for commodity production to expand and improve the depressed economy of the valley and Montana.

In RARE II, approximately 84 percent of responses to the RARE II DEIS supported wilderness for the area. The majority of local publics supported nonwilderness in the 1974 unit planning process, but not necessarily development options.

This area received the most comments of any roadless area during the Forest Plan DEIS review period. The majority of comments were opposed to any semiprimitive or wilderness designations. The primary reasons are: to assure an adequate supply of logs to mills as a vital part to the Bitterroot's economy; more than adequate wilderness exists; and to maintain motorized recreation use. Most of these respondents did not mention specific roadless areas whereas those opposed to development did. Comments specific to this roadless area favored wilderness designation. The primary reasons: fiscally prudent; it is not in the public interest to lose money on a timber road access program and put other resources at risk; high wildlife, watershed and recreation values; important meadow system; steep slopes; and roadless areas are becoming an increasingly scarce resource.

Testimony at the Montana Wilderness Study Act hearings (P.L. 950-150) in December 1985, is summarized as follows:

Wilderness Designation - The majority of respondents favored wilderness designation. The Blue Joint area is part of a large wild area. The area is important wildlife habitat including an elk travel corridor, and is home to other big-game species. The drainages in the Blue Joint roadless area are high quality watersheds. The relationship of forest cover to early snowmelt and the local dependence on irrigation water was a reason against development cited by some. Timber sales would be at a cost to the taxpayer. Many respondents stated the poor quality of timber in 100 percent of the area. Tourism and outdoor-based recreation are important, growing sectors in Montana's economy; they depend on clean water and undeveloped wild areas to draw visitors. Blue Joint has outstanding wilderness attributes, including opportunities for solitude, natural beauty and scenic diversity; and contains the historically and culturally important Southern Nez Perce Indian Trail. There is a need for wilderness nationally and only 3 percent of Montana is currently designated wilderness. There is a need to preserve the area for future generations to decide whether there are sufficient opportunities for primitive recreation. Logging and road building would cause erosion and irreparable damage to wildlife and their habitat, to water quality and fisheries, and to the scenery and backcountry recreation.

Developed Designation - About 16 percent of respondents favored developed management for the area. There is much wilderness within easy access of Hamilton and the Bitterroot Valley. Presently 22 percent of Montana's timbered area is designated wilderness. Wilderness does not satisfy a real need of the public, but a desire. Wilderness has no economic benefits and causes the loss of jobs in the wood products industry, a major part of the economy of Ravalli This economy is already depressed and the Forest Service has a responsibility to supply local mills with timber. Only part of the population can use wilderness - those who can walk - while a multiple-use forest can be used by everyone. According to Forest Service estimates, only 9 percent of Forest recreation users are in wilderness areas. In a 1982 poll of Montanans, only 11 percent of residents had visited a wilderness area that year. Development of other Forest areas has not caused damage to the environment, given the current numbers of big game and the quality of water and trout fisheries. This area does not have the characteristics to qualify it for wilderness designation. The meadows in Blue Joint are not unique; there are meadows in adjacent wilderness areas.

Timber/Road - About 30 percent of respondents commented about timber and roads. The most frequent comment was that the timber was of low quality, cannot be harvested on a positive cost-benefit basis, and would require taxpayer subsidies for road building. Other respondents argue that the timber can be profitably harvested. They also cited the number of jobs in the local timber industry and the dependency on several million board feet of timber annually from these areas. Several respondents stated that the current depressed market and economic situation for the local timber industry is a more complex problem than wilderness designation of roadless lands. Other respondents feel that past allocation of land to wilderness has been the cause of the present supply problem.

Recreation Use - About 20 percent of respondents commented about recreation use. Many of the comments stated that there were many opportunities other than the Blue Joint area open to 4-wheel drives, snowmobiles, and trailbikes. Snowmobile use in the Blue Joint area did not receive much comment. One respondent indicated use of the trail down Blue Joint Creek. Another stated that the Blue Joint area is a favorite motorbike area.

<u>Wildlife</u> - Comments centered on the variety and abundance of wildlife. The Blue Joint area was described as a haven for deer, elk, bighorn sheep and mountain goats; as an important elk travel corridor; and as a quality hunting area.

Economics - Many of the comments on economics were from respondents opposed to taxpayer-subsidized timber sales. Several respondents indicated they depend on the area for their livelihood, including trapping with the use of chain saws and snowmobiles, and grazing livestock. A number of comments were concerned with the local economy, jobs, tax base, and monies paid to the counties and state based on timber harvest levels. The growing tourism-recreation industry, dependent on wilderness areas to draw visitors to Montana, was also cited. Roadless areas will increase in value in the future, stated several respondents.

<u>Water Quality/Fisheries</u> - Comments focused on the value of Blue Joint as a quality watershed. Several comments were that forests retard snowmelt and runoff which is important for irrigation and local agriculture.

Minerals - The Blue Joint area has substantiated potential for cobalt, copper, silver, and barite. One respondent indicated that the Forest Service does not have the data available to determine if energy exploration would be insignificant. Another requested that no oil or gas leases be permitted in these areas in the final Forest Plans.

<u>Soils</u> - Comments described the area as sensitive, fragile, with erodible soils and short growing seasons.

#### E. Alternatives and Environmental Consequences

#### 1. Management Emphasis by Alternative

Management prescriptions providing for roads have been grouped into a roaded management emphasis since roading will preclude wilderness in the long term. The semiprimitive recreation emphasis will maintain the roadless character. Table C-7 displays total acreage assignment by management emphasis and development by decade for each alternative. Table C-8 shows suitable timberland and mineral potential acreage by management emphasis and alternative. Those Salmon Forest alternatives that are similar have been matched with Bitterroot Forest alternatives.

Only Bitterroot Forest impacts are discussed in Section E2 since the Salmon portion is so small.

Table C-7
Management Emphasis (Blue Joint)
(thousand acres)

Management			<b>-</b>					A	lter	native							-
Emphasis Bi	tterroot	Α		В	c		E	E	1	E2		P		C	H		J
Sa	lmon	1		2			.2	1	2	12		1		B 	2	1	1
Nonwilderness designation		65 9	65	4	48 6	5 31	7 4	37	4	37 3	65	9	21	2 (	5 3		0
Roaded Emphasis		49 5	49	0	35	2 1	3 1	18	1	17 2		5	18	7	L O		0
Bitterroot Forest		49 o	49	0	35 3	2 17	76	17	6	16 7		3	18	7	. 0		C
Salmon Forest		5		0	(	נ	5		5	5		5		0	0		C
Unroaded Emphasis		o		0	(	)	0		0	8		٥		0	0		0
Bitterroot Forest		0		0	c	)	0		0	8		0		0	o		0
Salmon Forest		o		0	(	)	0		0	0		0		0	0		0
Semiprimitive recreation Emp	hasis	16 4	16	4	13 4	19	3	19	3	19 3	65	4	2	5 5	3		0
Bitterroot Forest		16 4	16	4	13 4	1 19	3	19	3	19 3	65	4	2	5 5	3		0
Salmon Forest		0		0	c	)	0		0	0		0		0	0		0
Wilderness designation		0		5	17 3	3 28	3 5	28	5	28 5		0	44	7 59	6	65	2
Bitterroot Forest		0		٥	16 8	3 28	3.5	28	5	28 5		٥	44	2 59	1	64	7
Salmon Forest		٥		5	5	5	0		0	0		0		5	5		5
Area developed by																	
Decade 1		48	12	2	3 5	; 8	8	8	8	6 2		٥	4	7	0		0
Bitterroot Forest		48	12	2	3 5	; 8	8 8	8	8	62		0	4	7	0		0
Salmon Forest		a		o	C	,	0		0	0		Ø		0	ø		0
Decade 5**		65 9	65	9	35 7	17	6	18	1	18 1		5		0	o		0
Bitterroot Forest		65 4	65	4	35 2	2 17	6	17	6	17 6		0	18	7 1	. 0		Q
Salmon Forest		5		5	5	;	5		5	5		5		0	0		0
Area roadless in *																	
Decade 1		61 1	53	2	45 £	. 28	6	28	6	31 2	65	9	16	5 5	3		ø
Bitterroot Forest		60 6	53	2	45 1	. 28	1	28	1	30 7	65	4	16	5 5	3		0
Salmon Forest		5		0	o	)	5		5	5		5		0	0		0
Decade 5**		0		0	13 4	19	3	19	3	19 3	65	4	2	5 5	3		0
Bitterroot Forest		0		o	13 4	19	3	19	3	19 3	65	4	2	5 5	3		0
Salmon Forest		0		0	0	ı	ø		0	0		0		0	ø		0
Current roadless area		65 9	65	9	65 9	65	9	65	9	65 9	65	9	65	9 65	9	65	9
Bitterroot Forest		65 4	65	4	65 4	65	4	65	4	65 4	65	4	65	4 65	4	65	4
Salmon Forest		5	_	5	- 5	i	5	-	5	- 5	_	5		5	5	_	5

<sup>\*</sup> Does not include wilderness designations

<sup>\*\*</sup> Values shown for Decade 1 are planned outputs and effects. Values shown beyond Decade 1 are projections of the outputs and effects expected if the alternatives were selected to continue beyond the first decade

Table C-8
Suitable Timberland and Mineral Potential (Blue Joint) (thousand acres)

Management		-								A	1te:	rnatı	ve							<del>-</del>	
Emphasis Bi:	tterroot		A		В		C		Е	E	1	E	2		F		G		H		
Sa	lmon		1		2		2	·	12 1	1.	12 13	2		1		8		2		1	
Tentatively suitable land																					
Roaded emphasis		44	1	43	7	31	2	16	6	16	2	16	6		4	17	5		9		0
Bitterroot Forest		43	7	43	7	31	2	16	2	16	2	16	2		0	17	5		9		0
Salmon Forest			4		0		0		4		4		4		4		0		0		0
Unroaded emphasis			0		0		0		0		0		0		0		0		0		0
Bitterroot Forest			0		0		0		0		0		0		0		0		0		0
Salmon Forest			0		0		0		0		0		0		0		0		0		O
Semiprimitive recreation	emphasis		٥		0	6	4	15	4	15	4	15	4	43	7	2	4	4	5		0
Bitterroot Forest			0		0	6	4	15	4	15	4	15	4	43	7	2	4	4	5		0
Salmon Forest			0		0		0		0		٥		0		0		0		0		0
Wilderness emphasis			0		4	6	5	12	1	12	1	12	1		0	24	2	38	7	43	5
Bitterroot Forest			0		0	6	1	12	1	12	1	12	1		0	23	8	38	3	43	1
Salmon Forest			0		4		4		0		0		0		0		4		4		4
High mineral potential																					
Roaded emphasis		21	9	21	9	19	7	11	6	11	6	ħ	8		0	11	6		0		0
Bitterroot Forest		21	9	21	9	19	7	11	6	11	6	4	8		0	11	6		0		0
Salmon Forest			0		0		0		0		0		0		0		0		0		0
Unroaded emphasis			0		0		0		0		0	6	8		٥		0		0		0
Bitterroot Forest			0		0		٥		0		٥	6	8		0		0		0		0
Salmon Forest			0		0		0		0		0		0		0		0		0		0
Semiprimitive recreation e	mphasis	4	5	4	5	3	8	9	0	9	0	9	0	26	4	1	9	2	0		0
Bitterroot Forest		4	5	4	5	3	8	9	0	9	0	9	0	26	4	1	9	2	0		٥
Salmon Forest			0		0		0		0		0		0		0		0		0		0
Wilderness emphasis			0		0	2	9	5	8	5	8	5	8	12	9	24	4	26	4		
Bitterroot Forest			0		0	2	9	5	8	5	8	5	8		0	12	9	24	4	26	4
Salmon Forest			0		0		0		0		0		O		0		ā		0		0

#### 2. Impacts

a. Designation: WildernessManagement Emphasis: Wilderness

Virtually the entire area is recommended for wilderness in Alternative J with recommendations of 25, 43, 43, 69, and 90 percent in Alternatives C, E, E2, G, and H respectively. Recommendations would expand the wilderness system either as an addition to the Frank Church-River of No Return Wilderness or as a new wilderness. Alternative C preserves land with high wilderness attributes while minimizing effects on market outputs. Alternatives E and E2 incorporate that portion having the highest wilderness attributes, G adds land with high attributes, and H and J add more land with moderate to low attributes.

Tumber production is precluded on tentatively suitable land in this roadless area: all land in Alternative J, 14 percent in C, and 27, 27, 54, and 87 percent in E, E2, G, and H respectively. All land tentatively suitable for timber production amounts to 8 percent of the Forest-wide total.

Wilderness precludes consideration of semiprimitive recreation management in Alternative J and reduces the area available in C, E, E2, G, and H. Recreation use will continue to be dominated by hunting, fishing, and camping.

Under this management emphasis, mineral exploration and development is foreclosed subject to valid existing rights. All land rated as high potential in this roadless area is withdrawn in Alternative J and 11, 22, 22, 49, and 96 percent in Alternatives C, E, E2, G, and H respectively.

Nonpriced benefits and costs include:

- A natural level of visual quality is maintained.
- The wilderness system is expanded.
- A natural level of big-game forage and cover is maintained. Cover/forage ratios will be determined by natural events such as wildfire.
- Vegetative diversity tends towards old growth as modified by a more nearly natural role for wildfire.
- Old-growth dependent wildlife species are favored.
- Natural levels of watershed and fisheries are maintained.
- Local wood products employment decreases in Alternative G, H, and J, but should remain stable in C, E, and E2.

Economic and social effects vary depending on the amount of tentatively suitable timberland and area of high mineral potential recommended for wilderness. The wood products and mining industries would not be supported by this emphasis. Wilderness could attract more tourism and enhance outfitter activities. Publics interested in wilderness and primitive recreation opportunities would be supported, but those favoring mechanized use in a natural setting would not.

# b. Designation: Nonwilderness Management Emphasis: Roaded

Timber, range, winter range, partial retention, roaded retention, and riparian management prescriptions are in this emphasis. Some land in the Bitterroot portion of this roadless area is included in the emphasis in all alternatives except F and J. The highest level is in A and B where about 75 percent of the roadless area is in this emphasis; the lowest is in H at 2 percent.

Virtually all tentatively suitable timberland in this roadless area is assigned to this emphasis in Alternatives A and B, 71 percent in C, 40 percent in G, 37 percent in E and E2, and 2 percent in H. High-value old growth is scheduled for early removal; however, due to long rotations, old growth will be retained above the minimum level in partial retention, roaded retention, and riparian prescriptions. Early harvest is also scheduled in lodgepole pine stands which occupy much of the area.

Roads and timber harvest will foreclose future consideration for wilderness by the end of the fifth decade; however, from 75 to 100 percent will remain roadless at the end of decade 1. The roadless character would be changed to one including roads, reducing the naturalness and solitude of the area. Present semiprimitive recreation use would be disrupted as the recreation setting changes to roaded.

Access for mineral and energy exploration is enhanced as the road system expands. Lands of high mineral potential would be readily accessible in Alternatives A, B and C, and about 44 percent in E, E2, and G.

Transitory forage for livestock and wildlife is created by timber harvest.

Nonpriced benefits and costs for lands under this emphasis include:

- Visual quality will be at the lowest level (maximum modification) in Alternatives A and B, and the highest in G and H.
- Characteristics for future consideration as wilderness or semiprimitive recreation are foregone by the end of the fifth decade.
- Security cover for elk and other game will be greatly reduced in Alternatives A, B, and C; however, road closures will mitigate this effect.
- Vegetative diversity tends towards younger age classes in Alternatives A, B, C, and E, but a sizeable old growth component is retained in E2, G and H.
- Water quality is reduced but mitigated by high road construction and maintenance standards.
- Local wood products employment increases significantly in Alternatives A, B, and C; and remains at current levels in E, E2, G and H.

Economic effects vary depending on the amount of land that is suitable for timber production and the degree of constraints for visual, wildlife, and watershed values. The greatest positive effect is for Alternatives A, B, and C where most tentatively suitable land is retained in the timber base with few constraints. The wood products and mining industries are supported by this emphasis. Publics favoring roadless or wilderness characteristics would not be supported; however, much of the area would remain like it is for another 10 years. Those publics seeking semiprimitive recreation would have to shift use elsewhere. Outfitters could continue operations although the hunting experience would be altered.

## c. Designation: Nonwilderness Management Emphasis: Semiprimitive Recreation

The semiprimitive recreation prescription is the only one in this emphasis. Some land is included in this emphasis in all alternatives except J. The highest level is in Alternative F with virtually the entire area and the lowest in G at 4 percent. Unroaded management in A and B is confined to several relatively large, high elevation blocks that are not suitable for timber production.

Except for possible mineral entry, roadless characteristics will be retained within a core area in Alternatives C, E, E1, E2, F, G and H, and the land will remain available for future consideration as wilderness. The roadless character of the land would be maintained as would the wilderness attributes of naturalness and solitude. Current forms of recreation use will continue. Trailbike, snowmobile, and chain saw use are compatible.

Current levels of livestock use would continue.

Cover/forage relationships for wildlife will basically be determined by natural events such as wildfire, but can be modified by prescribed fire.

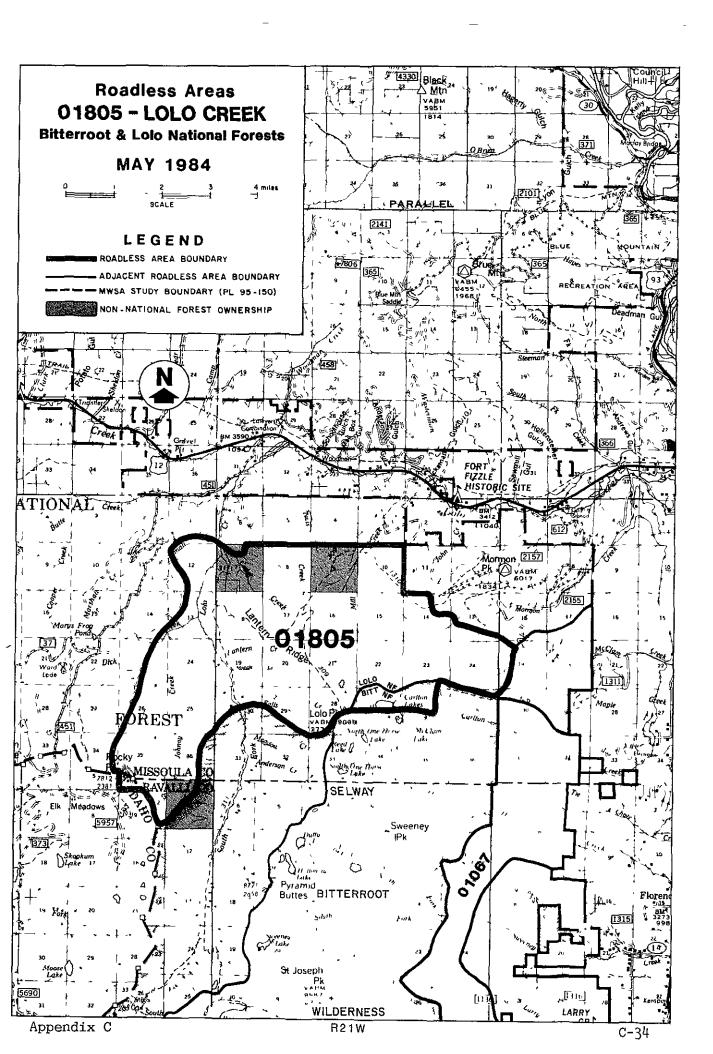
Roads are not needed for surface management purposes but will be permitted for mineral activities where construction is justified on the basis of mineral showings or data, and where it is the next logical step in development of the mineral resource. Fourteen, 34, 34, and 100 percent of lands with high mineral potential are assigned this emphasis in Alternatives C, E, E2, and F respectively.

Timber production is precluded on 15, 35, 35, and 99 percent of the tentatively suitable timber base in Alternatives C, E, E2, and F respectively. No tentatively suitable timberland is assigned this emphasis on the Bitterroot portion of this roadless area in Alternatives A and B, and only isolated and intermingled lands in Alternative C. Alternatives E, E2, and G incorporate lands of higher site quality, much of which would be difficult to develop because of low product values and/or difficult terrain.

#### Nonpriced benefits and costs include:

- A natural level of visual quality is maintained.
- The wilderness option is retained for future consideration.
- Near natural cover/forage ratios for big game are retained but may be modified by prescribed fire.
- Vegetative diversity tends toward old growth, but may be modified by prescribed fire.
- Old-growth dependent wildlife are favored.
- Natural levels of watershed and fisheries are retained.
- The current mix of recreation use is retained.
- Local wood products employment increases significantly in Alternatives A, B, and C; increases slightly in E, E2 and G; and remains stable in H.
- Access for mineral exploration would not be provided.

Economic and social effects vary depending upon the amount of tentatively suitable timberland in this emphasis. The effect is greatest in Alternatives E, E2, F, and G, with no effect in A and B. The wood products industry is not supported by this emphasis. Miners could continue to operate; however, costs would be higher without road access. Land would remain much like it is, thus supporting current recreation use, livestock grazing, and outfitters.



#### III. LOLO CREEK ROADLESS AREA

#### A. <u>Description</u>

This area is identified by number 01805. Roadless area acreage is:

National Forest	Gross Acres	Net Acres
Lolo	16,160	14,660
Bitterroot	587	587
Clearwater	100	100
TOTAL	16,847	15,347

This roadless unit lies 15 miles southwest of Missoula, 17 miles northwest of Stevensville, and 6 miles west of Lolo. State Highway 12 parallels the northern border at a distance of about 2 miles. From it, logging roads along Mill Creek, Cedar Creek and Dick Creek approach the northern and western margins. A road up Mormon Creek provides vehicle access to the eastern edge. Four system trails totaling 12 miles extend into and across this area. Refer to Table C-4 for proximity information.

The original RARE II inventory included 17,087 gross and 15,587 net acres. Road construction has reduced this area by 240 acres.

The Lolo Creek study area is situated immediately adjacent to the Selway-Bitterroot Wilderness Area on the north. The most prominent feature is the lower valley of the South Fork of Lolo Creek which rises on the east to the summit of Lolo Peak, a difference of about 4,500 vertical feet. Most of the streams flow to the north into Lolo Creek, and the slopes are heavily timbered. Lolo Peak and Rocky Point peaks are not timbered because of rocky, shallow soils.

Most of the area is in the subalpine fir habitat series with a variety of understories. There are also small amounts of the Douglas-fir habitat types. These occur between 4,500 and 7,000 feet elevation. Most of this area is classified as commercial timber land.

The area lies within the border zone along the contact between the Precambrian Belt Supergroup and the granitics of the Idaho Batholith. Granite, mica schists, and gneisses are exposed over most of the area. To the north, altered Belt Group rocks are found.

The Lolo Creek Roadless Area provides habitat for a variety of game and nongame wildlife species commonly found in western Montana including pileated woodpecker, pine marten, mountain goat and hoary marmot and other fur bearers. Visitors can often view deer and elk herds on summer range in the area.

Currently, popular recreational activities include hiking and trail biking, horseback riding, fishing, big-game hunting; and in winter, cross-country skiing and winter mountaineering sports activities.

#### B. Analysis of Wilderness Suitability

#### 1. Capability

#### a. Wilderness Attributes

#### (1) Naturalness

Ecological processes and the natural landscape in parts of the area have been disrupted to a certain extent by past and present domestic grazing. Basically, vegetative communities in the unit are similar to those found in surrounding areas outside the roadless boundary.

The bulk of the area is in the subalpine fir habitat series with understories of smooth woodrush, beargrass, menziesia, beadlily, bedstraw, bluejoint, and twinflower. About 20 percent is in the Douglas-fir habitat series with understories of ninebark, blue huckleberry, twinflower, and pinegrass. The rest of the area is spruce/twinflower and scree.

While most of the animal species native to the area are found in the Lolo Creek Roadless Area, none are particularly dependent on wilderness for survival. Animals on summer range can be susceptible to human activity and the area contains summer range. The area also contains a significant fisheries.

Air and water quality in the area are considered good.

The Lolo Creek Unit is significant because of its proximity to the Selway-Bitterroot Wilderness Area. Possible conflicts include a proposed ski area, potential for electronic site development, and possible mineral development. The Ward Lode Mine is located to the west with several of the claims staked in the roadless area. An irrigation dam is located on Carlton Lake, and the Carlton Ridge Primitive Road provides access to the dam.

A small ski run has been cut out by users along a portion of Lolo Peak Trail No. 1312. Several clearcuts and logging roads are visible outside the area. Fort Fizzle National Historic Site is located about 3 to 4 miles to the north near Lolo Creek.

#### (2) Inspirational Values

Although viewpoints from within include vistas of Missoula, Lolo and Florence, there are too many off-site intrusions for the area to provide any real inspirational value.

#### (3) Recreational Values

A major impact is the location of the area and its proximity to population centers. There is not an outstanding opportunity for solitude due to moderate to heavy visitation, frequent air traffic, and noise from highways. Portions of Highways 93 South and 12, the Ward Lode Mine, lookouts, and ranch buildings impact the appearance of the area. A 500 kV twin powerline under construction by the Bonneville Power Administration will be visible from the area.

Primitive recreation opportunities are very good due to steepness of terrain, rock cliffs, and proximity to the Selway-Bitterroot Wilderness. Good terrain exists for "expert" skiers.

#### (4) Cultural/Historical Values

A few old miners' cabins exist inside the area. There is an old lookout base on Lantern Ridge. These are not, however, significant historical sites. No prehistoric sites have been identified.

#### (5) Educational/Scientific and Unique Values

A portion of the roadless area was evaluated in a ski area feasibility study made by the Forest Service during the mid and late 1960's. Results of the study suggested the area had some potential and periodically interest is expressed by private individuals.

All but the northeast corner of the 920 acre Carlton Ridge Research Natural Area is located within the roadless area. The principle feature of the area is an extensive grove of alpine larch on well-developed soils. In addition, alpine larch and western larch are found at the same elevation which is uncommon. Studies indicate that hybridization between the two species has occurred on the site. This is one of the few areas known where this occurs.

Grizzly bears occupied the area in the historic past, but no bears have been sighted in many years.

#### b. Manageability and Boundaries

There are 1,500 acres of private land on the north end which will either have to be excluded or acquired. As currently drawn, the southern boundary follows the existing line of the Selway-Bitterroot Wilderness Area. Most of the western side follows drainage divides and would be easily marked and identified on the ground. However, the entire northern border is arbitrarily drawn to follow property lines which are not well marked or easily identified. Nonconforming uses include the four-wheel drive trail along Carlton Ridge, several miners cabins, and the foundation of an old lookout tower.

#### 2. Other Resources Found in the Area

#### a. Potential

The area provides habitat for a wide variety of game and nongame wildlife species (see Appendix B-2, Proposed Lolo Forest Plan, FEIS). On-site fisheries values exist in the South Fork of Lolo, Mill, and Johnny Creeks. There are 1,311 acres of elk summer habitat and 530 riparian acres.

The Lolo Creek area contains all or parts of nine issued oil and gas leases which cover approximately 75 percent of the land. Ten mining claims associated with Ward Lode Mine are located along the southwestern corner. These are in a zone of copper-lead-zinc-silver veins. Some gold values have also been found. The Forest inventory denotes 4,355 acres of high to very high mineral potential.

The Lolo Creek Roadless Area contains 129 acres classed as nonstocked, 1,148 acres of seedlings and saplings, 1,654 acres of poles, 2,202 acres of immature sawtimber, and 8,475 acres of mature sawtimber. Of this, 10,317 acres are classified as commercial timber lands. The suitable lands presently support a standing timber inventory of 72.3 MMBF with a long-term sustained yield in the area of 1.09 MMBF annually.

Portions of the East Fork/South Fork range allotment fall within this unit. The allotment is active and is permitted for 215 cow/calf pairs for approximately 292 animal months. Only about one-third of the Lolo Creek Roadless Area is considered to be suitable for grazing. The remaining two-thirds of the area is too steep and rocky. A small portion of the Anderson-Miller allotment is included in the area, but the suitable range acreage is not significant.

Significant features include the site for a potential ski area in the Lolo Peak/Carlton Ridge Area (see Management Area 6 description in the Lolo Forest Plan). Lolo Peak is a prominent viewpoint near the city of Missoula which receives moderate to heavy visitation year-round. This area is popular with cross-country skiers and is used for mountaineering winter sports activities. The area provides for a wide variety of recreational activities, including four-wheel drive use on Carlton Ridge, trail biking, hiking, horseback riding, snowmobiling, and environmental education activities. Fishing and big game hunting are popular in the area. The unit is classed as 35 percent semiprimitive motorized and 65 percent semiprimitive nonmotorized.

## b. Resource Summary

Gross acres			Wildlife - Big Game		
Lola Forest	Acres	16160	Summer Habitat		
Bitterroot Forest	Acres	587	Lolo Forest	Acres	724
Clearwater Forest	Acres	100	Bitterroot Forest	Acres	587
Total	Acres	16847	Clearwater Forest	Acres	0
			Total	Acres	1311
Net acres	_		Winter Habitat	Acres	٥
Lolo Forest	Acres	14660	at at at a sale at a sale a		
Bitterroot Forest	Acres	587	Significant Fisheries		
Clearwater Porest	Acres	100	Stream Miles	W/1	, ,
Total	Acres	15347	Lolo Forest Bitterroot Forest	Miles Mıles	4 3 1 0
D			Clearwater Porest	Miles	0
Recreation	RVD * s	0	Total	Miles	5 3
Primitive	RVD S	V	10042	Miles	<i>3</i> J
Semiprim Nonmot	DUD!	14660	Ct Hobitot		
Lalo Forest	RVD's RVD's	487	Stream Habitat Lolo Forest	11-5 A-	4 2
Bitterroot Forest Clearwater Forest	RVD's	100	Bitterroot Forest	Hab Ac Hab Ac	9
Total	RVD's	15247	Clearwater Forest	Hab Ac	0
Semiprim Motor (Bit		19241	Total	Hab Ac	5 1
Total	RVD's	100	Total	nau Ac	5 1
Roaded Natural	RVD's	100	Lakes	No	0
RORGED NACOTAL	NVD S	U	Lake Habitat	Hab Ac	0
Range			Lake Habitat	nau Ac	v
Existing Obligated (L	olo only)		Water Develop		
Suitable	Acres	4880	Existing	No	0
Allotments	No	1	•		
AUMs	AUMs	292	Hardrock Potential		
Existing Vacant		•	Very High	Acres	0
Suitable	Acres	٥	High (Lolo only)	Acres	3400
Allotments	No	0	Moderate		
AUYIS	AUMs	o	Lolo Forest	Acres	11260
Proposed			Bitterroot Forest	Acres	587
Sultable	Acres	0	Clearwater Forest	Acres	100
AUMs	AUMs	0	Total	Acres	11947
			Low	Acres	0
Timber					
Tentative Suitable	Acres		Mining Claums	No	10
Lolo Porest	Acres	10154	(Lolo only)		
Bitterroot Forest	Acres	163			
Clearwater Forest	Acres	0	Oıl & Gas Potential		
Total	Acres	10317	Very High	Acres	0
Standing Volume			High	Acres	0
Lolo Forest	MBF	70 6	Moderate	Acres	0
Bitterroot Forest	MBF	1 7	Low		
Clearwater Forest	MBP	0	Lolo Forest	Acres	14660
Total	MBF	72 3	Bitterroot Forest	Acres	587
			Clearwater Forest	Acres	100
Corridors (Lolo Forest o	· <del>-</del> ·	_	Total	Acres	15347
Exist & Pot	No	1	013 4 0 1		
Wildlife - T&E			Oil & Gas Leases	No	_
			Lolo Forest	No No	7
Grizzly Bear	Aana-	•	Bitterroot Forest	No	2
Habitat Sit 1	Acres	0	Clearwater Forest	No	0
Habitat Sit 2	Acres	0	Total	No	9
Habitat Sit 3	Acres	0	Inned to-		
Bald Eagle Hab	Acres	0	Leased Area	<b>.</b>	41000
Grey Wolf Hab	Acres	0	Lolo Forest	Acres	11000
Peregrine Fal Hab	Acres	0	Bitterroot Forest	Acres	587
			Clearwater Forest	Acres	11587
			Total	Acres	11587

#### c. Management Considerations

There are no management considerations identified within the area.

The management emphasis for the Lolo Creek Roadless Area is a combination of management prescriptions and alternatives from three National Forests, the Clearwater, Lolo, and Bitterroot. Because resources, uses, and land conditions are somewhat different on each Forest, neither the alternatives nor the management emphasis are fully integrated. Because the Lolo Forest is the lead Forest for this roadless area, for purposes of this evaluation, the alternatives and management emphasis from the other two Forests have been integrated into those of the Lolo Forest as close as possible on the basis of goals and objectives common to each Forest's alternatives and management emphasis.

Further information on the specific alternatives and management emphasis for the the Bitterroot portion of this area can be found in Section C. below, and for the Clearwater portion in the Clearwater Forest Plan EIS.

The proposed wilderness/nonwilderness designation for area 01805 is made and documented in the Lolo Environmental Impact Statement. This proposed designation has priority over all other land designations and none of the three Forests can undertake any management activity other than current direction until such time that a record of decision is issued in conjunction with the Lolo Forest Plan EIS.

#### d. Public Involvement

In the 1983 public involvement on Bitterroot Forest roadless areas, most of the comments on the Carlton Lake area were in favor of wilderness for the following reasons: contiguous to existing wilderness, nonwilderness activities would affect existing wilderness, and wilderness designation would enhance naturalness of Carlton Lake.

During public review of the Lolo Forest Plan DEIS, many comments were received in support of including this area in the National Wilderness Preservation System. Many respondents indicated support for the Governor's proposal for wilderness designation of the proposed area. Comments were also received that opposed any additional wilderness. Few respondents specifically opposed wilderness designation for this area.

Although many comments to the Bitterroot Forest Plan DEIS favored no additional wilderness or roadless, comments specific to this roadless area were equally split between favoring roadless designation and wilderness classification.

#### C. Alternatives and Environmental Consequences

The following discussion refers to designations, management emphases and alternatives in the Lolo Forest Plan EIS, but the Bitterroot and Clearwater areas are included. The Bitterroot National Forest portion of the Lolo Creek area would only be designated wilderness under Bitterroot EIS Alternative J. Under all other Bitterroot alternatives, the Bitterroot portion would have a roadless, semiprimitive recreation emphasis (see section 6: Nonwilderness/Roadless, below).

# 1. Designation: Wilderness Management Emphasis: Wilderness

Lolo Creek is allocated to wilderness in Alternatives D, F, and G. Alternatives F and G allocate the entire portion to wilderness. Alternative D allocates a portion of the area to wilderness.

Wilderness allocation can enhance the area's wilderness attributes since there are existing uses and facilities not usually associated with wilderness allocation. Any existing motorized activities could be eliminated.

The approximately 10,000 acres of land tentatively suitable for timber production would not be available. This would remove about 71 MMBF from the Forest timber base.

Big-game or elk management would not change. The area contains a small amount of summer habitat and cover/forage ratios should not change much over time except as influenced by wildfire control.

Current domestic livestock grazing of 292 AUM's could continue on portions of the area but use of motorized equipment would change.

Social effects under wilderness allocation would be reflected in recreation use which would continue to be dominated by hunting.

The nonpriced effects are:

- Visual quality would be preserved.
- Wilderness area would increase.
- Diversity would tend toward old growth without wildfire but could be improved depending on the control policy.
- Water quality and fisheries would be maintained at their present natural levels.
- Local employment may decrease slightly due to the unavailability of timber.

Economic effects are reflected in the fact that the area represents less than 1 percent of the land base suitable for timber, and other resource values would be retained. The loss in timber volume can be mitigated by practicing intensive forestry elsewhere. Mineral exploration opportunities would be foregone.

# 2. Designation: Nonwilderness Management Emphasis: Timber/Range

All alternatives allocate some of this area to timber management except F and G. Alternatives A, B, D, and E allocate from 2 to 5 percent and Alternative C allocates 60 percent.

Allocation to the timber prescription will forego the possibility of wilderness allocation by sometime after the end of the first decade. The area will be accessed with roads and harvest will be scheduled up to the limit of constraints for this prescription.

The nonpriced effects are:

- Visual quality would be at its lowest level, maximum modification.
- Semiprimitive recreation potential would be foregone by sometime after the end of the first decade.
- Wilderness characteristics would be compromised in a short time.
- Diversity would tend toward younger age classes with minimum old growth.
- Water quality and fisheries effects would be mitigated.
- The greatest number of jobs, mainly in the wood products industry, would be provided.

Economic effects are reflected in the fact that the area provides a small percentage of the timber available on the Forest.

 Designation: Nonwilderness Management Emphasis: Wildlife

The main emphasis in this prescription is old growth and summer range for big game. Alternative A allocates 10 percent of the area to wildlife management; Alternatives D and E, 22 percent; the other alternatives do not manage for this emphasis.

Development and vegetative manipulation may be required to achieve the habitat and forage management objectives. Timber harvest would occur if enough timber is available and could be used to achieve these objectives. Manipulation may include prescribed burning. Effects would not differ greatly from those listed in the timber emphasis but wildlife objectives are maintained.

4. Designation: Nonwilderness
Management Emphasis: Visual

Alternative A allocates 57 percent of the area to visual management. Alternatives B through E allocate from 7 to 10 percent and F and G do not manage for the visual resource.

Visuals are retained in the roadless management emphasis. Visual quality resource will be managed according to the management area classification. Effects are as listed under the timber management emphasis with visual objectives being maintained.

# 5. Designation: Nonwilderness Management Emphasis: Riparian

All alternatives contain inclusions of riparian zones and recognize the need to manage these areas according to policy and guidelines. Alternatives F and G are the wilderness alternatives and would not impact the riparian areas. Effects are basically as listed in the roadless emphasis.

6. Designation: Nonwilderness
Management Emphasis: Roadless

Alternative A allocates 17 percent; Alternative B, 90 percent; Alternative C, 28 percent; Alternatives D, 32 percent; and Alternative E, 58 percent.

The nonpriced effects are:

- Visual quality will be maintained at a very high level, Retention.
- Semiprimitive and wilderness attributes can be retained for a long period.
- Age class distribution and diversity would be dominated by old growth; young age classes would be minimal.
- Water quality and fisheries would not be affected.
- Few wood products related jobs would be added to the industry.

The economic effects of this emphasis are reflected in the fact that the area represents less than 1 percent of the land base suitable for timber, and other resources would be retained.

7. Designation: Nonwilderness
Management Emphasis: Miscellaneous

Miscellaneous management emphases include non-forest land, administrative sites, historical or cultural sites, mineral extraction sites, transportation and utility corridors, campgrounds, picnic areas, ski areas, and areas with concentrated public use.

Alternative A allocates 11 percent to these sites; Alternatives C, D, and E allocate from 1 to 4 percent and the other alternatives do not include management for these sites.

# ACRES OF AREA UNDER MANAGEMENT FOR EACH EMPHASIS BY ALTERNATIVE\*\* (Refer to Appendix C Introduction in the Lolo EIS for Management Areas under each emphasis.)

Management				Alterna	tives		
Emphasis	A	В	C	D	E	F	G
Nonwilderness							
Timber/Range Wildlife	631	337	8866	802	802	-	-
Grızzly bear	-	-	_	-	-	-	-
Other	1496	_	_	3287	3287	_	-
Visual	8375	1115	1478	1291	1291	_	-
Miscellaneous	1657	-	163	520	520	-	_
Riparian	*	*	*	525	525	-	_
Roadless	3188	13895	4840	4932	8922	_	
Wilderness							
Wilderness	-	-	-	3990	-	15347	15347
Total**	15347	15347	15347	15347	15347	15347	15347

<sup>\*</sup> Small inclusions occur in other management emphasis items

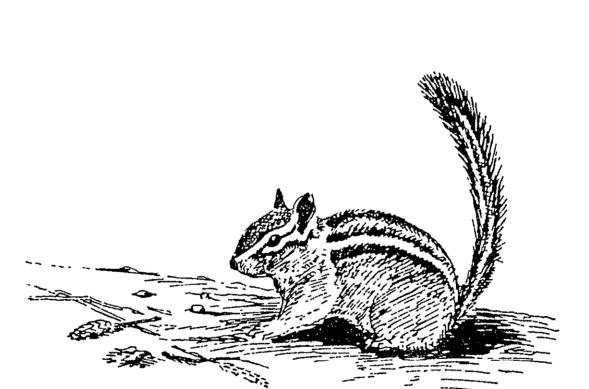
#### SUMMARY OF MANAGEMENT EMPHASIS (acres managed by decade)\*

#### Developed

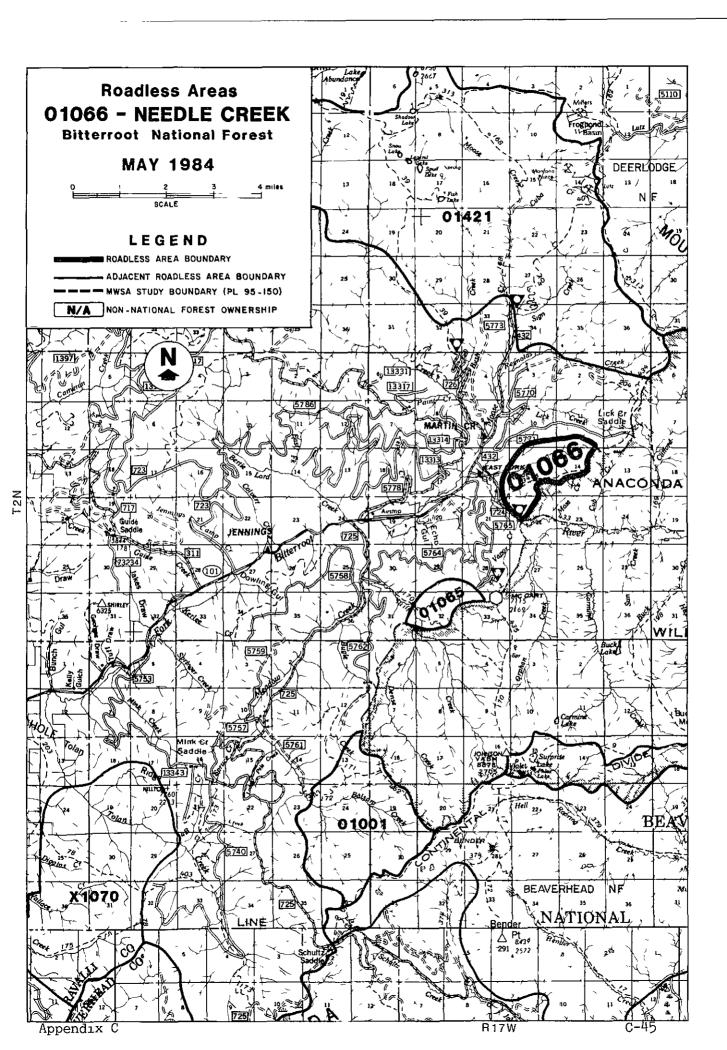
Decade 1	-	-	-	-	-	<u>-</u>	~
Decade 5	12159	1452	10507	6425	6425	-	
Roadless							
Decade 1	15347	15347	15347	15347	15347	-	-
Decade 5	3188	13895	4840	8922	8922	-	
Wilderness Decade 1 Decade 5	<u>-</u>	- -	379 Nati	- -	<del>-</del>	15347 15347	15347 15347

<sup>\*</sup> Includes Bitterroot and Clearwater National Forest portions. (The Bitterroot portion is included in the Roadless acres for both decades under all Lolo alternatives except F and G.)

<sup>\*\*</sup> Includes Bitterroot and Clearwater National Forest portions. (The Bitterroot portion is included in the NONWILDERNESS/Roadless acres for all Lolo alternatives except F and G.)



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#### IV. NEEDLE CREEK ROADLESS AREA

This area is identified by number 01066, the same as RARE II. Roadless area acreage is:

National Forest	Gross Acres	Net Acres
Bitterroot	1,085	1,085

#### A. Description

This roadless area is located in southeast Ravalli County, Montana. Hamilton, the county seat, is about 30 air miles to the northwest. The Anaconda-Pintler Wilderness borders the eastern boundary. The southeast boundary parallels the East Fork Road which ends at a major trailhead near the present wilderness boundary. Most remaining lands outside the boundary have been developed for timber production. Access to the area is from U.S. Highway 93 and the East Fork Road. Trail 434 passes through the area and provides access along the western boundary of the adjoining wilderness.

The area includes all but the very lower portion of the Needle Creek drainage. Elevations range from about 5,400 to 7,000 feet.

Forests cover most of the area, interspersed with several rocky talus slopes. North-facing slopes have mostly lodgepole pine, and south-facing slopes have Douglas-fir with scattered, large ponderosa pine. Ground cover is beargrass and huckleberry with bunchgrass on the warmer sites.

#### B. Analysis of Wilderness Suitability

#### 1. Wilderness Attributes

#### a. Natural Integrity and Appearance

The natural integrity of this area is unaltered and the area has a natural appearance to users.

#### b. Opportunities for Solitude

Opportunities for solitude are diminished by the smallness of the area, the roads which bound two-thirds of the perimeter, the sight of extensive management activities adjacent to the area, and its separation from the existing wilderness by a prominent ridge.

#### c. Primitive Recreation Opportunities

Primitive recreation opportunities are limited to short duration hikes, hunting, and berry picking. The lack of special attractions and unique features, along with the steep topography, limit recreation use primarily to big-game hunting.

#### d. Other Features

There are no special attractions or unique features.

#### 2. Manageability and Boundaries

The adjoining Anaconda-Pintler Wilderness is 157,874 acres. The present wilderness boundary follows a high, prominent ridge, which separates the roadless area from the adjoining wilderness. Although the area is manageable as wilderness, the new boundary would be far less effective in separating the sites, sounds, and influences of man than the present boundary.

The following adjustment in net acreage has taken place since the RARE II inventory:

Adjustment	Acres
RARE II inventory	1,100 -15
Refined acreage calculation Current inventory	1,085

## C. Availability for Wilderness

#### 1. Resource Potential and Use

Table C-9 Needle Creek Roadless Area Resource Potential and Use

Category	Unit	Bitterroot Forest
Gross area	Acres	1,085
Net area	Acres	1,085
Recreation		, , ,
Primitive	RVD's	
Semiprimitive nonmotorized	RVD's	100
Semiprimitive motorized	RVD's	0
Roaded natural	RVD's	0
Wildlife habitat		
Elk & deer		
Summer range	Acres	452
Winter range	Acres	633
Rocky mountain goat	Acres	0
Bighorn sheep	Acres	0
Fisheries streams	Miles	0
Lakes	Number	0
Fisheries lakes	Acres	0
Water developments	Number	0
Livestock range		
Current use	AUM's	0
Suitable rangeland	Acres	0
Current allotments	Number	0
Other suitable	Acres	0
Timber		
Tentatively surtable	Acres	1,061
Standing volume	MMBF	9.5
Corridors		
Existing/potential	Number	О
Mineral potential		
Very high	Acres	0
High	Acres	0
Moderate	Acres	1,085
Low	Acres	0
Mining claims	Number	7
011 & gas potential		
Very high	Acres	0
High	Acres	0
Moderate	Acres	0
Low	Acres	1,085
Leases	Number	0
Leased area	Acres	0

#### 2. Selected Resource Values

#### a. Recreation

Current use is very light consisting primarily of big-game hunting but includes some day hiking and berrypicking.

#### b. Wildlife

Elk, moose, mule deer, black bear, grouse, and numerous nongame birds and animals are common to the area. Needle Creek is not large enough to sustain a trout fishery but does provide spawning areas for fish moving out of the East Fork of the Bitterroot River.

#### c. Water

Water from the area is used extensively for downstream irrigation.

#### d. Livestock

There is no current use or suitable area for grazing.

#### e. Ecology

Varied topography, aspect, and elevations provide a moderate diversity of ecosystems that are well-represented in existing wilderness.

#### f. Timber

Approximately 97 percent of the area is tentatively suitable for timber production. Standing timber volume is estimated at 9.5 MMBF. Site productivity is generally high due to the relatively low elevation.

#### g. Minerals and Energy Resources

A minerals survey has been completed (Elliott et al., in press; Wallace et al., 1983). Hardrock mineral potential is low. Mining claims are located along the western boundary. Along with historic prospecting work, an operating plan has been approved but no work has commenced. Although oil and gas lease applications have been received for almost the entire area, none have been issued since the area was recommended for wilderness in RARE II. Traditional theory places the oil and gas potential as low.

#### h. Cultural

Nothing is known about cultural remains.

#### 1. Land Use Authorizations

There are no permits. Rights are confined to the several mining claims.

#### J. Non-Federal Lands

The area is entirely National Forest ownership.

#### k. Other Considerations

#### (1) Fire

Fire occurrence and the potential for large fires is low.

#### (2) Insects and Disease

Insects and disease are generally endemic; however, dwarf mistletoe reduces growth in some areas as does spruce budworm, a recurrent pest.

#### D. Need

#### 1. Proximity to Existing Wilderness and Population Centers

See Tables C-1 and C-2.

#### 2. Contribution to the Wilderness Preservation System

The area would add a small acreage to the Anaconda-Pintler Wilderness with some sacrifice of manageable boundaries. Ecosystems and wildlife species are well-represented in existing wilderness.

#### 3. Public Interest

Most of the comments favored wilderness in the 1983 public involvement on roadless areas, primarily because the roadless area borders existing wilderness and elk winter range would be protected. Several comments favored multiple use because of high timber values and 90 percent of the area is commercial forest.

In RARE II, 71 percent of the responses to the RARE II DEIS favored wilderness and 29 percent nonwilderness. Montana's governor did not recommend wilderness for the area (Schwinden, 1984); however, the Montana state bill (S. 2850) of 1984 did.

The majority of comments on the Forest Plan DEIS were opposed to any semiprimitive or wilderness designations. The primary reasons are to assure an adequate supply of logs to mills as a vital part to the Bitterroot's economy and there is more than adequate existing wilderness. Most of these respondents did not mention specific roadless areas, whereas those opposed to development did. Comments specific to this roadless area favored wilderness. The primary reasons are: it is not in the public interest to lose money on a timber road access program and put other resources at risk, it is contiguous with the Anaconda-Pintler Wilderness, and roadless areas are becoming an increasingly scarce resource.

## E. Alternatives and Environmental Consequences

## 1. Management Emphasis by Alternative

Management prescriptions providing for roads have been grouped into a roaded management emphasis since roading will preclude wilderness in the long term. The semiprimitive recreation emphasis will maintain the roadless/undeveloped character. Table C-10 displays total acreage assignment by management emphasis and development by decade for each alternative. Table C-11 shows suitable timberland and mineral potential acreage by management emphasis and alternative.

Table C-10
Management Emphasis (Needle Creek)
(thousand acres)

Management						Alte	rnative					
Emphasis	Bitterroot	Α	В	C	E	E1	E2	f	G	Н	J	
Nonwilderness desi	gnation	1 1	o	0	1 1	1 1	1 1	0	o	0	(	
Roaded Emphasis		1 0	0	0	1 1	1 1	1 1	0	0	0	(	
Unroaded Emphasi	s	0	0	0	0	0	٥	0	0	0	(	
Semiprimitive re-	creation Emphasis	0	0	0	0	0	0	0	0	0	(	
Wilderness designa	tion	0	1 1	1 1	0	0	0	1 1	1 1	1 1	1	
Area developed by												
Decade 1		0	0	0	0	0	0	0	0	0	(	
Decade 5**		1 1	0	0	1 1	1 1	1 1	0	0	0	(	
Area roadless in *												
Decade 1		1 1	0	0	1 1	1 1	1 1	0	0	0	C	
Becade 5**		0	0	0	0	0	0	0	0	0	C	
Current roadless a	cres	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 1	1 :	

<sup>\*</sup> Does not include wilderness designations

Table C-11
Suitable Timberland and Mineral Potential (Needle Creek) (thousand acres)

Management						Alternative					
Emphasis	Bitterroot	A	В	С	E	E1	£2	P	G	н	J
Tentatively surtabl	e land	4.0	0	0	1 1	1 1	1 1	o	0	0	
Roaded emphasis Unroaded emphasis		1 0	0	0	0	0	0	0	0	0	
Semiprimitive recreation emphasis		0	0	0	0	0	0	0	0	0	
Wilderness emphasis		0	1 1	1 1	0	0	0	1 1	1 1	1 1	1

<sup>\*</sup> This area has no high mineral potential

<sup>\*\*</sup> Values shown for Decade 1 are planned outputs and effects. Values shown beyond Decade 1 are projections of the outputs and effects expected if the alternatives were selected to continue beyond the first decade

#### 2. Impacts

a. Designation: WildernessManagement Emphasis: Wilderness

The entire area is recommended for wilderness in all alternatives except A, E, E1, and E2. The recommendation would increase the size of the adjacent Anaconda-Pintler Wilderness by 1,085 acres.

Timber production is precluded on all tentatively suitable timberland in Alternatives B, C, F, G, H, and J. This amounts to 1,061 acres, about 0.2 percent of the Forest total.

Wilderness classification precludes semiprimitive recreation emphasis designation. Recreation use will continue to be dominated by hunting. Mechanized use such as trailbike, snowmobile, and chain saw would be prohibited.

Minerals exploration and development is foreclosed subject to valid existing rights. None of the area has a high mineral potential.

Nonpriced benefits and costs are:

- A natural level of visual quality is maintained.
- The wilderness system increases.
- A natural level of big-game forage and security cover is maintained. Big-game cover/forage ratios would be determined by natural events such as fire.
- Vegetative diversity tends towards old growth but is modified by a more nearly natural role for wildfire.
- Old-growth dependent wildlife species are favored.
- Natural levels of watershed and fisheries are maintained.
- Local wood products employment decreases in all alternatives except A, E, E1, and E2.

Economic and social effects vary depending upon the amount of tentatively suitable timberland in this emphasis. The effect is greatest in Alternatives B, C, F, G, H, and J, but total effect is minimal since this is only about 0.2 percent of the Forest-wide total. About 9.5 million board feet of standing timber would not be available for harvest. The dominant species are lodgepole pine and Douglas-fir. The wood products and mining industries would not be supported by this emphasis. Public interest in wilderness for the area and those using the area for semiprimitive recreation would be supported. Recreation use would continue to be dominated by hunting.

#### b. Designation: Nonwilderness Management Emphasis: Roaded

Timber, range, partial retention and riparian management prescriptions are in this management emphasis. Alternatives A, E, E1, and E2 designate all of the area to this emphasis.

All tentatively suitable timberland is included in Alternatives A, E, E1 and E2. High-value old growth is scheduled for early removal. After the first decade, lodgepole pine stands will be harvested.

Roads and timber harvest will foreclose future consideration for wilderness by the end of the fifth decade; however, the area would remain roadless at the end of decade 1. The roadless character of the area would be altered as roads reduce the naturalness and opportunities for solitude. Present semiprimitive recreation use would be disrupted as the recreation setting would be roaded.

Access for mineral and energy exploration would be enhanced as the road system expands.

Transitory forage for wildlife would be created by timber harvest.

Nonpriced benefits and costs include:

- Visual quality will be at the lowest level (maximum modification) in Alternatives A and a moderate level (partial retention) in E, E1, and E2.
- Characteristics for future consideration as wilderness or semiprimitive recreation are foregone by the end of the fifth decade.
- Security cover for elk will be greatly reduced in Alternatives A, E, E1, and E2. Road closures will minimize the impacts on elk security.
- Vegetative diversity tends towards younger age classes.
- Local wood products employment increases slightly in Alternatives A, E, E1, and E2.
- Water quality is reduced but mitigated by high road construction and maintenance standards.

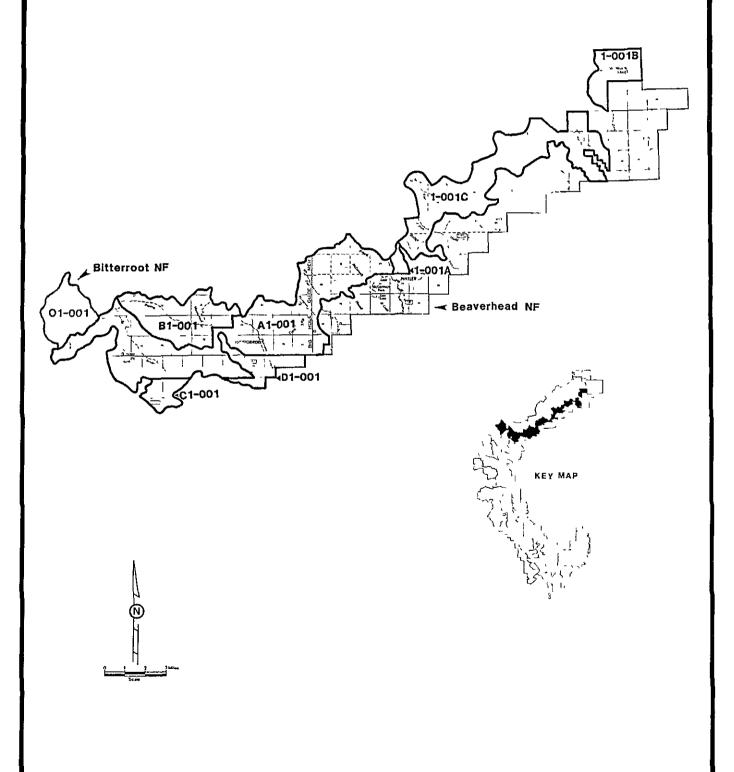
Economic effects vary depending upon the amount of land that is suitable for timber production and the management of visual, wildlife, and watershed resources. The greatest positive effect on the economy is in Alternative A, E, E1, and E2 where all of the tentatively suitable land is retained in the timber base. This is insignificant in terms of the Forest-wide total.

The wood products and mining industries would be supported. Publics favoring the roadless or wilderness characteristics would not be supported although the area would remain much like it is for another 10 years. Those publics using the area for primitive and semiprimitive recreation would have to shift their use elsewhere.



# ROADLESS AREA 1-001

# NORTH BIG HOLE



# V. NORTH BIG HOLE ROADLESS AREA

Beaverhead and Bitterroot National Forests

		Gross Acres	Net Acres
Roadless Area Name:	North Big Hole (1-001)		
	1-001A	715	715
	1-001B	3,217	3,217
	1-001C	14,372	14,372
	A1-001	24,332	24,332
	B1-001	6,571	6,571
	C1-001	1,521	1,521
	D1-001	2,470	2,370
	Total	53,198	53,098
	Bitterroot NF	3,691	3,691

# A. Description

The Beaverhead and Bitterroot Forests share the North Big Hole Roadless Area with the Bitterroot having about seven percent of the area. The units in this roadless area lie in the northwest portion of the Big Hole Planning Unit, primarily bordering the Anaconda-Pintler along the southern and southeastern edges. The portion of area 1-001 administered by the Bitterroot National Forest lies on the extreme southern boundary of the Anaconda-Pintler Wilderness Area and adjacent along the Continental Divide to the Beaverhead A1-001 unit. On the Beaverhead, the North Big Hole Roadless Area extends from Seymour Creek in 1-001B to Johnson Creek, bordering area C1-001.

Area 1-001A is located centrally in 1-001 from Pintler Creek on the west and bordered by Area A1-001, extending as far as the east edge of Section 11, R. 15 W., T. 1 N. and terminating at Area 1-001C. The Anaconda-Pintler Wilderness forms the northern boundary, and on the south are developed forest lands. The area is accessible from Montana State Highway No. 43 via Forest roads No. 1203 and No. 185. At Pintler Creek, Area 1-001A also defines the western edge of the Wise River Ranger District.

Area 1-001B shares the northeastern edge of the Beaverhead National Forest boundary with the Anaconda-Pintler Wilderness on the north. Area 1-001B is accessible from Forest road No. 934 off Montana State Highway No. 274. Developed forest lands reach approximately four miles south to the Forest boundary. Major drainages are Seymour Creek, Chub Creek, and East Fork LaMarche Creek.

Area 1-001C occupies a larger area between 1-001A and 1-001B, bordered on the northern edge by the Anaconda-Pintler Wilderness and on the south by developed Forest lands, within two to three miles from the southern Forest boundary. LaMarche Creek drains through the eastern end of 1-001C; Mudd Creek through the west sections. Other drainages include the Middle Fork Fishtrap and Swamp Creek. This area is accessed by Forest roads No. 1223, No. 1203 and No. 935 from State Highway No. 43.

The Anaconda-Pintler Wilderness and area B1-001 form the northern boundary of Area A1-001. It is almost divided by developments around Mussigbrod Lake; the north edge of C1-001 borders the area at Sections 10 and 11, R. 17 W., T. 1 S. Forest road No. 1245 edges the west end of A1-001 near Bender Point and a narrow arm approximately one-half mile wide and four miles long extends west from the area at the Continental Divide. Forest roads No. 1245, No. 5732, and No. 185 also provide access to A1-001. Drainages flowing through the area are Bender, Plimpton, Thompson, Howell and Pintler Creeks. Campgrounds and public access are provided at Bender, Thompson and Johnson Creeks. Glacial troughs in this area are very narrow and rocky.

Area B1-001 is a more remote one situated between the Anaconda-Pintler Wilderness on the north and by A1-001 on the south. It is accessed by trails No. 372 and No. 379 from Mussigbrod Lake and from trail No. 110 along the Continental Divide from Forest road No. 1137. Hellroaring Creek and Mussigbrod Creek drain through the area. Sections of this area have been strongly glaciated and contain steep, rugged peaks, high rocky cirque basins, and deep U-shaped glacial troughs. Area B1-001 is also characterized by light forest containing open ridges and terrain. Outstanding scenic features include rock spires, historic rifle pits and unconfirmed but assumed teepee rings.

Area C1-001 reaches southward from A1-001 at Sections 1 and 11, R.17 W., T. 1 S. as far as Johnson Creek and Forest road No. 1137 at its southwest margin. The boundary on the southeast excludes Forest road No. 1203.1. The only major drainage, Bender Creek, flows northward to the Big Hole River through this roadless area.

Area D1-001 is completely surrounded on its north by area A1-001 and the Forest boundary edges its south side at Sections 2, 3, and 10 of R. 16 W., T. 1 S. The main feature of the area is the 102-acre Mussigbrod Lake, which is accessed by Forest roads No. 5732 or No. 185.

The Bitterroot portion is bordered on the east by the Anaconda-Pintler Wilderness, on the south by A1-001, and the remainder by roads and areas of timber harvest.

These roadless areas are comprised of the gentle to moderately steep foothills of the Anaconda Range. Deep U-shaped glacial trough valleys cut across the unit at Plimpton, Mussigbrod, Thompson, Howell and Pintler Creeks which flow southeast to the Big Hole River. Other major drainages are Seymour, LaMarche, Mudd, Bender and Johnson Creeks. Some of these canyons are very narrow and rocky. Well-defined terminal glacial moraines fan out at the mouths of each of these valleys. Elevations vary only moderately from 6300 to 8800 feet. Average annual precipitation is 25-30 inches, 70 percent of which occurs as snow.

Soils in the upper elevational portion of the areas are shallow, weakly developed, coarse loamy sands. Soils in the moraines are stony, sandy loams. Parent materials in this area are granitic rocks. Soils on the unglaciated gentle ridges are deep and moderately deep loams and fine sandy loams.

Vegetative cover is predominantly forest with subalpine fir, grouse whortleberry, lodgepole pine, and some Douglas-fir and spruce types. Valley bottoms contain willow and wet meadow at lower elevations and grade into aspen and Engelmann spruce at higher elevations.

## B. Capability

# 1. Natural Integrity and Appearance

As a whole, the North Big Hole Roadless Area has retained much of its natural appearance. Man's influence is evident primarily through range developments, jeep and foot trails, limited campground facilities, and simple bridges. These impacts are relatively localized and, in most cases, are screened by the broken topography and vegetation in the area.

The Northside road intrudes into area A1-001 from Pintler Creek to Clam Valley; however this road is presently closed as it crosses the East Fork of Thompson Creek. There is a gravel road leading to the Seymour Campground in area 1-001B. A road into Swamp Creek (area 1-001C) leads to a timber unit which was scheduled to be cut in June 1984. This 37 acre cutting unit is located in Sections 13 and 14, T. 2 N., R. 14 W.

There are end-of-road horse facilities on Pintler and Seymour Creeks and an unimproved camping area on Pintler Lake.

The Bitterroot portion of 1-001 is still quite natural appearing and the natural integrity of the area would be rated high.

# 2. Opportunities for Solitude

Opportunities for solitude are provided by the broken topography, vegetative screening, and relatively light use of portions of this area. These opportunities are fewer near the campgrounds and trails but become more prevalent as one moves toward the wilderness boundary. Some parts of the area are nonforested or only lightly forested and contain open terrain that is used by motorized vehicles, thereby impacting solitude opportunities. Summer motorbike use and winter snowmobiling also impact these opportunities. Areas 1-001B and 1-001C provide relatively few opportunities for solitude because of the traffic in/adjacent to the roadless areas, and other management activities, such as logging, that occur near the units.

# 3. Primitive Recreation Opportunities

Primitive recreation opportunities provided by this roadless area are those associated with hiking, camping, and nonmotorized fishing and hunting. These opportunities are enhanced/impacted by conditions and activities mentioned above. Primitive recreation opportunities are also enhanced by the nearness of the roadless area to the Anaconda-Pintler Wilderness.

### 4. Other Features

Freshwater clams are found in some streams in the roadless area.

# 5. Wilderness Manageability

Areas A1-001 through D1-001, 1-001A through 1-001C, and the Bitterroot portion are adjacent to the Anaconda-Pintler Wilderness. Some boundary adjustments with respect to this wilderness would make the area more manageable. The jeep trail to Mudd Lake in 1-001C is obscure and could be included without deleting from the area. 1-001B is a small area (3,217 acres) whose size could become a factor should it be decreased in size; however, it contains wilderness characteristics sufficient to be included with the neighboring Anaconda-Pintler Wilderness. Essentially, inclusion of these areas in a wilderness classification would serve as a buffer to the Anaconda-Pintler Wilderness since they have little to offer independently. The addition of the Bitterroot portion would not contribute significantly to the current wilderness, since the boundary is presently very manageable as it exists.

Beaverhead NF 1977 Inventory Acres: 1983 Inventory Acres: Change	38,300 gross <u>53,198</u> + 14,888	37,810 net 53,098 + 15,278
Reasons for change in inventoried acres: FY 1984 Timber Sale and roads Existing Timber Sale & roads Addition of Unit Plan roadless Acreage Recalculation	- 3,972 - 5,356 + 23,719 + 507	- 3,972 - 5,356 + 23,719 + 897
Bitterroot NF  1977 Inventory Acres: 1983 Inventory Acres: Change	3,800 <u>3,691</u> - 109	3,800 3,691 - 109
Reasons for change in inventoried acres: Existing Timber Sale & roads Acreage Recalculation	- 480 + 371	- 480 + 371

# C. Availability

# 1. Resource Potentials

		1-001A	1-001B	1-001C	A1-001	B1-001	C1-001	D1-001	1-001	COMBINED
CATEGORY	UNIT	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	VALUE	Bttr	VALUE
Acres										
Gross	Acres	715	3217	14,372	24,332	6571	1521	2470	3691	56,889
Net		715	3217	14.372	24.332	6571	1521	2370	3691	56,789
Decreation										
Recreation	nun I -		41	182	05	83	5	30	0	445
Primitive	RVD's	9		265	95	121	8	44	200	844
SPNM	RVD's	13	59 -8	-	134				0	647
SPM	RVD's	13	58	262	142	120	9	43	U	047
Range										
Existing obligated				- 6 6 -		<i>.</i>				0
suitable	Acres	44	226	3680	2314	60	192	1611	180	8307
Allotments	# of	1	0	3	5	1	1	2	1	8*
AUM's	AUM's	17	0	1005	639	53	177	605	15	2511
Existing vacant										
suitable	Acres	0	0	0	0	0	0	0	0	0
Allotments	# of	0	0	0	0	0	0	0	0	0
Timber										
Tentative suitable	Acres	702	2879	13,321	18,760	3850	1303	1546	2470	44 831
Standing Volume	MBF	3183	14,190	76,431	107,991	21,611	7295	8963	19,500	259,164
Corridors										
Existing/Potential	# of	0	0	0	o	0	0	0	0	0
Wildlife T&E										
Bald Eagle	Acres	0	О	0	0	0	0	o	0	0
Big Game										
Winter Habitat	Acres	197	0	1699	3199	177	447	1554	0	7273
Elk		-,.					•			
Winter Habitat	Acres	0	o	0	243	o	0	77	0	320
Deer				-			-	• • •	-	3
Winter Habitat	Acres	0	0	0	0	0	0	0	o	0
Significant Fisheries		·	· ·	Ū	ŭ	•	ŭ	·	ŭ	·
Stream Miles	Miles	4	5 7	16 3	31 0	9 5	15	49	1	70 3
Stream Habitat		9	24	19 6	14 7	16	3 3	-		=
Lakes	Acres	0	4	•	14 /			77	15	51 7
	# of			17		5	3	16	0	61
Lake Habitat	Acres	0	21	33	47	10	7	134	0	252
Water Developments		_		_	_	_				
Existing	# of	0	0	0	o	0	0	0	0	2
Minerals										
Very High	Acres	0	0	0	0	0	0	0	0	0
High	Acres	0	3217	0	0	0	0	0	0	3217
Moderate	Acres	715	0	14.372	24,332	6571	1521	2370	3691	53 572
Low	Acres	0	0	_0	o	0	0	0	0	0
Claims	# of	0	0	o	0	0	0	0	0	0
Oil and Gas Potential										
Very High	Acres	0	0	0	О	0	0	0	0	0
High	Acres	0	0	0	o	0	0	0	o	0
Moderate	Acres	715	3217	14,372	24 332	6571	1521	2370	3691	56 789
Low	Acres	0	0	0	0	0	0	0	0	0
Oil and Gas Leases		-	•	*	-	=	<del>.</del>	-	=	•
Leased area	Acres	715	3127	9652	16,800	260	781	520	1100	32 955
neasen area	Acres	1+2	3441	7002	10,000	200	101	520	1130	J= 775

<sup>\*</sup> Portions of allotments may be contained in several roadless areas The combined value displays total allotments occurring across a group of areas

### a. Recreation

Area 1-001A has no developed recreational facilities; however, Pintler Creek campground is located a short distance to the north. Visitors use Forest road No. 185 and trail No. 37 through 1-001A as access to the scenic Pintler Falls located in the Anaconda-Pintler Wilderness.

Area 1-001B--activities in this region include camping, plant identification, bird watching, and hunting and fishing; with one improved campground on Seymour Creek, and an end-of-road horse facility. Seymour Lake, with a surface area of 15 acres, is a popular recreation site in 1-001B. Trail No. 131 that provides access to Upper Seymour Lake and the Anaconda-Pintler Wilderness is closed yearlong to motorized vehicles for erosion control and safety.

Area 1-001C--recreational opportunities in this region are limited to those provided by primitive settings. Spectacular vista points and scenic views are common.

Area A1-001 includes two developed recreational sites—a four-table campground at Mussigbrod Lake and an unimproved campground at Pintler Creek. Dispersed recreational opportunities are numerous. Vehicle use occurs at lower elevations. Trailheads at Mussigbrod and Pintler campgrounds lead to the Anaconda-Pintler Wilderness. A1-001 is also popular for hunting and fishing; one outfitter is authorized to use this area.

Area B1-001 recreational opportunities are limited to those provided by primitive settings.

Area C1-001 provides no campgrounds or other developed sites, but dispersed recreational activities such as firewood cutting are significant here.

Area D1-001 has numerous dispersed recreational activities at the 102-acre Mussigbrod Lake. Vehicle use occurs at lower elevations, especially on Forest road No. 5732 which is heavily used as access to Mussigbrod Lake and Forest trail No. 372.

The Bitterroot portion offers recreation opportunities that are limited to those provided by primitive settings.

### b. Wildlife

Area 1-001A--provides summer forage and cover for bear, deer, elk, moose, and furbearers common to western Montana. Major streams support brook and cutthroat trout. Tributaries to the Big Hole River are important spawning areas, including spawning habitat for brook and cutthroat trout and grayling from the Big Hole River.

Area 1-001B is inhabited by mountain goats in the more rugged terrain along the Continental Divide, with very little suitable elk or deer winter range, but with a significant elk summer range. Major streams are used for spawning by Big Hole River fish.

Area 1-001C--populations of Rocky Mountain goats use a salt lick along the west fork of Fishtrap Creek and there is also a blue heron rockery at the pond in this same vicinity. The area is considered to be important elk summer range. Major streams of the area are inhabited by brook and cutthroat trout. Tributaries to the Big Hole River are important spawning areas.

Area A1-001 provides summer forage and cover throughout for deer, elk and moose. The wildlife habitats include moose winter range, elk calving and rutting areas, limited elk winter range, elk wallows, cliffs, and riparian zones, and a unique area of glacial deposits and water-filled potholes. Most elk and deer migrate to the Bitterroot Valley and Fleecer range in early winter. The larger streams sustain mainly brook trout, although some cutthroat and rainbow trout are present. Arctic grayling are common in Mussigbrod Creek and freshwater clams inhabit most streams of the area (Clam Valley). Numerous beaver dams are constructed along meandering, willow-lined streams.

Area B1-001 is inhabited by mountain goats in the more rugged terrain along the Continental Divide. Major streams here provide spawning grounds for the Big Hole River fishery.

Area C1-001 at lower elevations provides some big game winter range, but most deer and elk migrate from this area in early winter.

Area D1-001 provides summer forage and cover for deer, elk and moose. Arctic grayling are common in Mussigbrod Lake and Creek.

The Bitterroot portion contains summer forage and cover for deer, elk and moose. Mountain goats inhabit the more rugged terrain along the Continental Divide.

### c. Water

Water quality in 1-001 units is high, with all streams providing tributaries to the Big Hole River. Streams are heavily used for irrigation between June and September. The area contains many miles of irrigation ditches.

Area 1-001C--during low water periods, approximately 60 percent of the runoff reaches the Big Hole River.

Area A1-001 contains many miles of irrigation ditches and a dam at the outlet of Mussigbrod Lake.

Area 1-001 Bitterroot--water quality is high. Balsam Creek provides a tributary to the Bitterroot River.

### d. Livestock Operations

A large portion of the Anaconda Range is being grazed by permitted livestock, consisting entirely of cattle and horse allotments.

Area 1-001A is all under the Pintler Creek Allotment No. 48.

Area 1-001B has not been allotted for grazing permits.

C-61

Area 1-001C--only the lower southern and extreme western portions of this unit are grazed by cattle and horses. Parts of four allotments are included in this area; No. 46 (Mudd Creek), No. 48, (Pintler Creek), No. 59 (Fishtrap), and No. 39 (LaMarche), which is a closed allotment. This area is predominantly forest, with some grassland parks and stringers along the southern boundary.

Area A1-001--approximately 90 percent of this area is grazed by cattle and horses, in five existing open allotments which encompass 24.57 miles of fence and four spring developments; No. 48 (Pintler Creek), No. 55 Clam Valley), No. 62 (Howell Creek), No. 63 (Johnson Creek), and No. 65 (Mussigbrod). This involves six permittees and 604 cow/calf pairs. Rangeland consists of open sage and grassland at lower elevation, complemented by scattered moist bottomlands and grass stringers.

Area B1-001 contains the top one-fifth of No. 65 (Mussigbrod Creek Allotment), but includes no grazeable land.

Area C1-001 is grazed by cattle and horses under the Johnson Creek Allotment No. 63.

Area D1-001 is covered with the Mussigbrod Creek Allotment No. 65 and Clam Valley Allotment No. 55.

Only the gentle lands adjacent to Balsam Creek are used by livestock in the Bitterroot portion of 1-001.

### e. Ecology

Upper elevations exhibit mostly subalpine fir/whitebark pine habitats while the lower elevations contain Douglas-fir habitats. The majority of this area is currently occupied by seral lodgepole pine stands ranging in age from 80 to 250 years. Englemann spruce habitats are found in the area but are contained mostly in riparian and wet areas.

To date there are no known threatened and endangered plant species on National Forests and Grasslands according to Bob Gale, Northern Region T&E specialist. However, there are Penstemon lemhiensis; Scrophulariaceae and Botrychium paradoxum which may occur on or near roadless areas 1-001A, 1-001B, and 1-001C.

# f. Timber

Vegetative cover in this entire area is predominantly forest at higher elevations along the southern incline of the Anaconda Range, gradually sloping to stringers of grassland along the many creek bottoms and small meadows scattered throughout the area. Valley bottoms also contain willow and wet meadow at lower elevations, grading into aspen and Engelmann spruce at higher elevations. The forest is predominantly lodgepole pine, with some Douglas-fir on lower southfacing slopes. Whitebark pine and subalpine fir grow at higher elevations in the head of Mussigbrod Creek and along a few elevated ridges. Timber has been harvested in Mudd and Fishtrap drainages in 1-001C. The forest here contains substantial amounts of harvestable timber-growing sites. Timber harvest in A1-001 has been concentrated in the Howell Creek timber sale. B1-001 and 1-001 Bitterroot contain high elevation timber types, most of which are not on sites suited for timber production because of steep slopes, poor stocking, and rocky ground.

## g. Minerals/Oil and Gas

Geologic favorability is high within 1-001B for locatable minerals. Geologic favorability for locatable minerals is moderate within 1-001C, A1-001, B1-001, C1-001, D1-001, and the Bitterroot portion. Geologic favorability for oil and gas is moderate for all areas.

### h. Cultural Resources

Old rifle pits and mining remnants provide evidence of area history. Although past use of the entire Big Hole area by native Americans suggests that undiscovered cultural resources may exist in this roadless area, none have specifically been identified.

### i. Land Use Authorizations

Land use authorizations include Bender cabin, Bender pasture, and Bender lookouts in A1-001 on Johnson Creek, with numerous trapper and miner cabins, irrigation ditches, several fences, and telephone and electrical power transmission lines. There are no land use authorizations in the Bitterroot portion.

### 1. Non-Federal Lands

There are 100 acres of private land in D1-001. None of the other portions of the North Big Hole Roadless Area contain private land.

# 2. Other Management Considerations

### a. Fire

Fire occurrence is low in all areas, generally, but a potential exists in A1-001 due to downfall of substantial amounts of lodgepole pine at lower elevations (near the Northside road). Area 1-001B and C have moderate to extreme fire conditions.

### b. Insect and Disease

In some areas of 1-001, wilderness designation may increase the risk of mountain pine beetle infestations which are presently sporadic and endemic. This insect presents slight risk in areas 1-001B and C.

### D. Need

### 1. Proximity to Other Designated Wilderness and to Population Centers.

The northern boundary of the North Big Hole Roadless Area is adjacent to the Anaconda-Pintler Wilderness and is situated about 90 miles from the Lee Metcalf Wilderness. Use of these wildernesses is presently moderate, depending upon the particular area. Population centers close to 1-001 are Butte, 50 miles; Anaconda, 50 miles; Hamilton, 60 miles; and Missoula, 100 miles.

# 2. Contribution to Wilderness Preservation System

This area would contribute ecological diversity to the National Wilderness Preservation System. Wilderness designation would increase the land in the NWPS, and help to lessen the pressure placed on existing wildernesses by recreationists seeking wilderness and primitive recreation experiences.

### 3. Public Interest

During RARE I, portions of the North Big Hole were inventoried in No. 44 Bender and No. 39 LaMarche Roadless Areas and in an Essentially Roadless Area referred to as "Thompson." All of these areas were recommended for nonwilderness uses in that Study.

In 1977 the North Big Hole roadless and Essentially Roadless Areas, and a small, adjacent roadless area on the Bitterroot National Forest were inventoried as a single roadless area to be studied in the RARE II process. The Beaverhead National Forest was, at that time, conducting a Forest-wide planning process, and, through that process and in coordination with the Bitterroot National Forest, evaluated the wilderness potentials of the 1-001 areas. The decision reached through the Forest planning process was to retain two portions of the roadless area (then referred to as A1-001 and B1-001) in the RARE II process and to manage the balance of the area for other nonwilderness resource values. Public comment during the Forest planning process indicated some support for wilderness classification for areas A and B1-001. However, there was also public controversy, particularly over area A1-001, because of the timber values in that area.

The majority of the area in A and B1-001 was proposed for wilderness in RARE II by the Montana Wilderness Association. Alternative W, proposed by MWA, was supported by the environmental organizations. In addition, B1-001 received much favorable public comment for classification as a wilderness. Although the remainder of 1-001 was not considered highly controversial during the RARE II process, there was opposition for a wilderness designation from those concerned about the area's timber potential.

In 1983 the 1-001 area was again included in the Roadless Area inventory. Comments received in reply to the "1983 Roadless Area Evaluation" brochure indicated strong support for wilderness designation of much of the inventoried area. Many of the respondents indicated that the area would be an "ideal addition to the existing wilderness," that the area had high wildlife, scenic, and watershed values. Some commented that the area should become wilderness to protect it from degradation of surface values by oil and gas exploration and development. Others stated that the area added diversity to the existing wilderness and that recreation uses exceed all other values. Some based their support for wilderness on the idea that the designation would protect the Big Hole watershed. The Bitterroot Forest received several comments in favor of roadless designation, mainly to protect wildlife. The Bitterroot Forest received one comment that opposed wilderness designation specifically for this area because of high timber value and mineral potential.

Comments on the 1985 Beaverhead Revised Draft again indicated continued support for wilderness designation of all or portions of the North Big Hole Roadless Area. The area drew strong support particularly from the many commenters for the "Conservationist Alternative" in which 37,000 acres of the Beaverhead Forest portion of Roadless Area 1-001 were recommended for wilderness. Most of the support came from regional and national commenters although some local groups and individuals also voiced support. Minor opposition to wilderness designation of the area was expressed, primarily by those who generally opposed wilderness, supported "multiple use," or had specific concerns for portions of the area. Some Big Hole Valley residents were concerned about expansion of the wilderness recommendation beyond the 6,571 acres proposed for wilderness in the Revised Draft EIS.

Timber harvest in the LaMarche Creek area concerned some respondents who expressed interest in retaining the scenic values and winter recreation opportunity and quality in the area adjacent to the Sundance Lodge.

Comments to the Bitterroot DEIS favored nonwilderness and roadless designation for all roadless areas; however, comments specific to this area all favored wilderness designation.

# E. Alternatives and Environmental Consequences

# 1. Management Emphasis by Alternative

### Management Emphasis by Alternative for the North Big Nole Roadless Area (1-001), Beaverhead Portion

Alternative (Net Acres) Beaverhead s\*\* C Ð F G 11. Management Α PΛ Emphasis Group 1 1/ 1-001A 1-001B 1-001C 14,372 14,372 14,372 24,332 A1-001 24,332 24,332 24,332 24,332 B1-001 C1-001 D1-001 o Group 2 2/ 1-001A Q 1-001B 1-001C 12,072 12,072 10,635 11,210 11,785 15,329 A1-001 12,166 o B1-001 C1-001 o D1-001 Group 3 3/ 1-001A o a 1-001B Ò 1-001C o o o O A1-001 ø B1-001 Q Q C1-001 D1-001 o Q Group 4 4/ 1-001A 1-001B 1-001C A1-001 12,166 17,033 20.925 B1-001 C1-001 D1-001 1-001A Group 5 5/ 1-001B Q Q Q Q Q a 1-001C a o a A1-001 a a n o 14,135 O B1-001 Ω α C1-001 o D1-001 

53.098 53.098 53.098 53.098 53.098 53.098 53.098 53.098 53.098

BFAVERHEAD TOTAL

<sup>\*</sup> Land designations for Alternatives H. HA, and H(dept) are the same, therefore only H is displayed

<sup>\*\*</sup> Land designations for Alternatives S and SA are the same, therefore only S is displayed

<sup>1/</sup> Group 1 is Wilderness emphasis

<sup>2/</sup> Group 2 is Timber emphasis

<sup>3/</sup> Group 3 is High Range, High Range with Low Intensity Wildlife, (No Timber) emphasis

<sup>4/</sup> Group 4 is Primitive/Semiprimitive Recreation, Custodial emphasis

<sup>5/</sup> Group 5 is High Range/High Wildlife, Moderate/Low Range, Wildlife (No Timber) emphasis

# Management Emphasis by Alternative for the North Big Hole Roadless Area (1-001), Bitterroot Portion

Alternative (Net Acres)

0 872 0	0 2872 0	0 403	0	o	CD*	3628	0	3139	PA**
872 0	2872			0	o	3628	0	3139	0
0		403	1001						
-	0		1901	1901	2068	0	436	240	735
0		0	0	0	0	0	0	0	0
_	0	629	0	0	0	0	176	24	0
0	0	0	0	0	0	0	0	288	0
0	0	0	0	0	0	0	0	0	0
0	0	70	20	20	0	0	20	0	0
B19	819	2585	1770	1770	1623	63	3059	0	2956
591	3691	3691	3691	3691	3691	3691	3691	3691	3691
•	0	0 0 0 0 819 819 691 3691	0 0 0 70 0 0 70 819 819 2585 691 3691 3691	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

1/ Relates to Beaverhead Group 1, on previous page

Bitterroot

- 5/ Relates to Beaverhead Group 5, on previous page
- 2/ Relates to Beaverhead Group 2, on previous page
- 6/ Relates to Beaverhead Group 4, on previous page
- 3/ Relates to Beaverhead Group 5, on previous page
- 7/ Relates to Beaverhead Group 5. on previous page
- 4/ Relates to Beaverhead Group 2, on previous page
- 8/ Relates to Beaverhead Group 4, on previous page

### Summary of Management Emphasis, Beaverhead Portion

Alternative (Net Acres)

Management	A	В	С	D	P	G	H	I	W	s
Emphasis	CD*									PA**
Roaded										
Decade 1	15,882	17,734	3891	0	21 480	26,769	14,464	0	22,195	11,352
Decade 5 ***	46,527	53,098	3891	0	21,480	29,941	25.592	0	22,195	20 084
Roadless										
Decade 1	30,645	35,364	0	3891	0	19.758	32,063	0	0	35,175
Decade 5 ***	0	0	0	3891	0	16,586	20,935	0	0	26 443
Wilderness	6571	0	49,207	49,207	31,618	6571	6571	53,098	30,903	6571

<sup>\*</sup> CD is the Current Direction Alternative

<sup>\*\*</sup> PA is the Proposed Action Alternative

<sup>\*\*\*</sup> The "decade 5" projection represents what would occur in 50 years if implementation of the management designations and activity schedules associated with each alternative were perpetuated through the 10 - 15 year periodic revisions

### Summary of Management Emphasis Bitterroot Portion

#### Alternative (Net Acres)

Management	A	В	С	E	E1	F	G	н	J	E2
Emphasis						CD*				PA*
Roaded										
Decade 1	2000	2000	700	1300	1300	1500	0	600	500	0
Decade 5 ***	2872	2872	1102	1921	1921	2068	0	632	552	735
Roadless										
Decade 1	1691	1691	2991	2391	2391	2191	63	32	52	3691
Decade 5 ***	819	819	2589	1770	1770	1623	63	0	0	2956
Wilderness	o	0	٥	0	0	o	3628	0	3139	0

<sup>\*</sup> CD is the Current Direction Alternative

### 2. Impacts

(Impacts discussed below are considered for the entire roadless area, including the Bitterroot portion. Alternatives referred to are Beaverhead Forest alternatives.)

a. Designation: WildernessManagement Emphasis: Wilderness

Of the North Big Hole Roadless Area (A through D1-001 and 1-001A through C), 100 percent is designated wilderness in Alternative I. In Alternatives C and D, 93 percent is designated wilderness. Approximately 60 percent of the area is designated wilderness in Alternatives F and W. Area B1-001 is designated wilderness in Alternatives A, G, H and S (the Proposed Action). This constitutes 12 percent of the total area.

Wilderness can slightly enhance the area's wilderness attributes since there are some existing uses and facilities not usually associated with wilderness designation. These are found in the lower or fringe areas of D1-001 and A1-001. The existing roads in and motorized use of the area, other than that associated with maintenance of historically-established range use--the Seymour Creek road No. 484, Pintler Creek road No. 185, and portions of the Northside road No. 1203 and the York Gulch road No. 1203.c (Wise River Ranger District)--could be eliminated. Established trail systems, other than those used primarily for range management, could be used for foot travel to the places of interest in the area. Without snowmobile and trailcycle use (Wise River Ranger District) these trails would be naturally narrowed in time. The Northside and York Gulch roads enter area 1-001C in sections 6 and 7, T. 1 N., R. 14 W., and section 1, T. 1 N., R. 15 W.

<sup>\*\*</sup> PA is the Proposed Action Alternative

<sup>\*\*\*</sup> The "decade 5" projection represents what would occur in 50 years if implementation of the management designations and activity schedules associated with each alternative were perpetuated through the 10 - 15 year periodic revisions

The 3850 to 44,831 acres of land tentatively suitable for timber production would not be available under this prescription depending upon the alternative chosen. This would remove about 21.6 to 259.2 MMBF in standing volume from the Forest timber base depending upon the alternative chosen. This land is distributed in stringers and patches located on middle and lower slopes in Roadless Areas A through D1-001. The timber is predominantly lodgepole pine with minor amounts of other species growing on site class V and VI land. Existing volumes are highly variable due to differences in site productivity and stocking density. The lower elevations contain the better timber sites with existing volumes averaging 7-12 MBF/acre.

The loss in timber volume is not likely to be mitigated by increasing the intensity of timber management on areas remaining in the timber base. Factors affecting the ability to mitigate this loss include total forest volume lost due to wilderness classification, other resource standards that affect the Forest's ability to increase intensity of timber management, and increased costs associated with more intensive management that may result in reduced PNV (present net value).

Current livestock grazing, 2511 AUM's, would continue on the portions of the 8 allotments involved. Some of the involved allotments need to be placed under improved management systems to improve or maintain riparian values and range conditions. Presently, some permittees use vehicles to access and manage livestock within affected allotments. If wilderness designation were to preclude this activity, permittees would have to adjust to using horses and/or pack mules. This would require more time and cost. Permittee commitment to managing livestock is confined to lower elevations, on sagebrush hillsides, riparian bottomlands and wet and dry meadows.

Grazing systems now in effect would continue. Wilderness designation may preclude further vegetative manipulation, pipelines, water developments, and fences solely benefiting the range resource and could effect eventual livestock carrying capacity.

Wildlife habitats would not change much in the short-term period, because existing forage and timber security levels would be maintained. Long-term changes might occur to various wildlife species, depending on natural events within these roadless areas, and effect wildlife populations negatively or positively. Basically wildlife habitat management would be accomplished through natural fires, and long-term effects would approximate a natural situation. Wildlife population levels would vary, sometimes greatly. Big game key habitats, such as meadows and sagebrush foraging areas, goat lick along the West Fork of Fishtrap Creek and moose winter range along the major creek bottoms, would be maintained. The key blue heron rockery at a small pond along a ridge near the Middle Fork of Fishtrap would be maintained. There are no notable winter ranges in areas west of Pintler Creek though occasionally a few elk may winter in the lower portions of D1-001 and A1-001. Elk spring, summer and fall habitat would not be significantly impacted though some sagebrush or open areas may be lost through conifer encroachment.

Other nonpriced resource values are affected as follows:

Visual quality would be retained and, over time, improved. The assigned "preservation" VQO would allow ecological changes only, except in very small, site-specific instances where there are existing developments (irrigation ditches, fences) and locations where visual impacts would be minor. Irrigation ditches are located in East Fork Mudd Creek, West Fork Fishtrap Creek, Middle Fork Fishtrap Creek, and East Fork Fishtrap Creek.

The absence of timber activities under this designation will allow the lodgepole pine stands to become overmature and highly susceptible to mountain pine beetle. Eventually a beetle epidemic will kill the larger trees and leave an extreme fire hazard. If fire is allowed to occur naturally, the stands will again regenerate to lodgepole pine. There will be vast acreages of essentially even-aged lodgeople pine. If fire is excluded from the ecosystem, the stands will continue towards climax and greater diversity of species, age, and size classes will result. There will be more representation of shade tolerant alpine fir, Engelmann spruce, and Douglas-fir.

Water quality and fisheries quality would be maintained at natural levels. Presently, in D1-001, a headgate and irrigation ditch exist. Maintenance activities on these structures may be restricted.

Social and economic effects center around the resource values of timber, minerals, range, wildlife, recreation, and wilderness. Since wilderness precludes timber harvest, the related industries would not be supported by this emphasis. Timber supply Forest-wide would drop, resulting in a loss of jobs and income. The service sector, including resorts and outfitter and guide operations, could benefit from the attraction of more wilderness. From a social aspect, the publics valuing wilderness would be supported. Although grazing would be allowed in wilderness, the everyday operations probably would be managed through non-mechanical means, such as access by horse rather than by truck. This change could require more time and have higher costs to the grazing operators. Hunting and other recreational experiences would also be altered to those that could occur without vehicular access, but this would mean retaining the present high quality experience.

Under a wilderness designation, this area would eventually be closed to further mineral entry (claim location) and leasing. Removal of this acreage from the resource base leaves less acreage available for mineral and energy resource exploration. The overall probability that these resources can be found and developed will decrease as the resource base available to explore decreases. Presently there is little or no mineral activity west of Pintler Creek.

Current information indicates mining claims exist in Mudd Creek. No impact on wilderness character from the exercise of valid existing rights is anticipated.

As of December, 1983, there were approximately 32,955 acres of oil and gas leases issued with surface occupancy. Exercise of rights granted to lessees or assignees by lease issuance could severely impact the wilderness character of the area.

# b. Designation: Nonwilderness Management Emphasis: Timber (Modification/Maximum Modification and Retention/Partial Retention)

Portions of the North Big Hole Roadless Area (A, C and D1-001 and 1-001A through C) are assigned to these prescriptions in all Alternatives except D and I; from 6 percent in Alternative C, to 65 percent in Alternative B. Area B1-001 is not assigned to these prescriptions in any alternative.

Timber management (visual quality objectives modification/maximum modification) will severely impact the wilderness and roadless resources in that timber removal requires construction of permanent roads and modifies the natural appearance of the area for approximately 25 to 40 years, (or until the regeneration is high enough to hide the scars and present the appearance of an old burn). The stumps and incompletely burned slash piles would also be long-term, onsite evidences of man's activities. The cutting units themselves would be impacts visible from Highway 43 and Forest access roads to the Anaconda-Pintler Wilderness. Many of the higher productivity timber sites are at lower elevations and on gentle north-facing slopes. These areas would not be visible from the Big Hole Valley and area highways, but would be visible from the Anaconda-Pintler Wilderness Area.

Under timber prescriptions with visual quality objectives of retention/partial retention, there will be increased efforts to "fit" the cutting units and the road designs to the "lay of the land" to mitigate the visual impacts of the timber harvest activities.

The attendant roads, by definition, eliminate the "roadless" nature of an area, and any dirt-moving activities have extremely long-term impacts on the naturalness of the area-much longer than the actual timber harvest. Within a given timber sale area, the total area actually impacted by roads will probably be significantly less than that impacted by the cutting units, but the visual impact of the roads will be greater. Cutting units may be designed to reflect natural openings in the canopy and/or changes in the texture of the canopy. Roads may appear as unnatural, linear intrusions even when the actual road prism is screened by trees. Roads serve as travelways, inviting more use, providing much easier access, and lessening the opportunities for solitude in the area.

Range resources would benefit minimally by the creation of transitory range which may become available for grazing. Also, timber harvest may remove natural barriers requiring additional and costly fencing to maintain intensive management systems. Range activities, however, would not significantly affect the wilderness potential.

The harvest scheduled in this roadless area could be shifted to other parts of the same analysis areas but not without exceeding the constraints designed to meet alternative objectives.

Other nonpriced resource values are affected as follows:

In areas where visual quality objectives are modification or maximum modification, man's activities will dominate the landscape. Impacts will be evident not only within the timbered areas, but in nontimbered areas where roading occurs and from other areas within sight of the intensive timber management areas.

In areas where visual quality objectives are retention or partial retention, impacts may be evident but less severe than those created by more intensive timber management activities.

The opportunities for semiprimitive recreation will be somewhat reduced under these prescriptions. Primitive recreation will be affected very little.

Elk security will be reduced in the short-term if existing stands are removed from cover capability. Long-term impacts would tend to stabilize at a slightly lower level of security cover than currently exists. The degree of these security cover losses will relate to the magnitude of the timber harvest in the area. Security cover is located nearby in the Anaconda-Pintler Wilderness.

Water quality and fisheries may be adversely affected but effects would be mitigated in accordance with Forest standards and guidelines.

In areas where modification/maximum modification visual quality objectives are applied, extensive timber harvest will bring about a greater distribution of age and size classes. However, this harvesting will tend to perpetuate lodgepole pine dominance. Prescriptions that do not allow for vegetative manipulation in the range program will allow the timber-range ecotones to become dominated by Douglas-fir.

In areas where visual quality objectives are retention/partial retention, use of smaller and irregular shaped harvest units may be required. Harvest will favor seral stands of lodgepole pine. There will be a trend toward better distribution of age and size classes brought about through timber harvest.

These prescriptions provide for the greatest number of jobs in the timber and lumber manufacturing-related industries.

Social and economic effects center around the resource values of timber, minerals, wildlife, recreation, grazing, and wilderness. Timber and mineral resources would be available, thus supporting the wood products and minerals industries. Persons wanting to enter the Anaconda-Pintler Wilderness would have to pass through this area to reach the wilderness. Visitors climbing the high peaks would look down on managed (harvested areas) reducing their feelings of solitude. Outfitter and guide operations would need to move into the Wilderness to get away from harvested areas and associated roads. Their operations would be concentrated into a smaller area. Publics valuing wilderness would not be supported by this management emphasis.

Assignment of prescriptions 10-15, 10-17, 10-18, 10-13, 9-12, 9-14, or 14-14, 30-20, 30-16, 30-19, or 15-24 would not restrict access for mineral and energy resources. Assignment of prescriptions 12-22, 20-29, or 23-32, 17-26, 5-5, 6-6, 33-7, 24-33, 32-34, 31-14, 19-28, 11-21, or 26-35 would moderately restrict access for mineral and energy resources. Assignment of NRT CORR prescription would severely restrict access for mineral and energy resources.

# c. Designation: Nonwilderness Management Emphases: Range (No Timber, High Intensity Range and Low Intensity Wildlife)

No alternatives considered assignment of any acres to these prescriptions in the Big Hole Roadless Area (A through D1-001 and 1-001A through C).

d. Designation: Nonwilderness

Management Emphases: Primitive and Semiprimitive

Recreation/Custodial

Portions of the North Big Hole Roadless Areas (A, C and D1-001 and 1-001A through C) are assigned these prescriptions in all Alternatives except I; from as little as 2 percent in Alternative C, to 49 percent in Alternative H.

As long as areas managed under primitive and semiprimitive recreation and custodial emphases remain roadless, they will retain existing natural conditions although no acreages will be large enough to maintain the wilderness potential. The prescriptions in this category allow roads to access special uses or mineral development. Custodial management also allows road construction for access to other management areas. If roads are constructed, visual qualities and opportunities for solitude and primitive and semiprimitive recreation will decline.

Range activities would continue at present levels and would not be significantly affected.

Other nonpriced resource values are affected as follows:

Unless roading occurs for special uses or mineral development or to provide access to other management areas, visual quality will be retained.

Elk security will be maintained in the short term and slightly decreased in the long term as timbered areas age and begin to deteriorate.

Water quality and fisheries would not be affected by management activities.

The absence of timber activities under these prescriptions will allow the lodgepole pine stands to become overmature and highly susceptible to mountain pine beetle. Eventually a beetle epidemic will kill the larger trees and leave an extreme fire hazard. If fire is allowed to occur naturally, the stands will again regenerate to lodgepole pine. If fire is excluded from the ecosystem, the stands will continue towards climax and greater diversity of species, age and size classes will result. There will be more representation of shade tolerant alpine fir, Engelmann spruce and Douglasfir. Also, by excluding fire we would allow timber-range ecotones to become dominated by Douglas-fir rather than sagebrush.

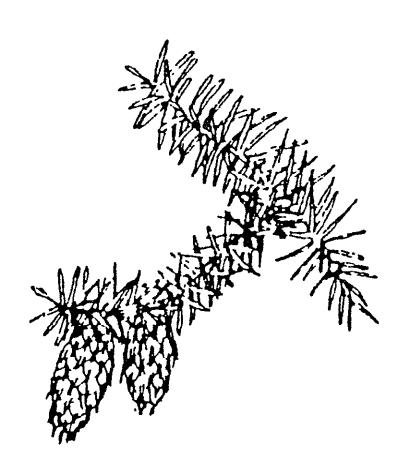
Since these management emphases maintain the area much like the existing condition, current public uses on the scattered parcels would also be maintained. A variety of recreation experiences would be available including primitive, semiprimitive nonmotorized, and motorized recreation. Use in these areas is mostly in hunting season and as wilderness portals to the Anaconda-Pintler Wilderness. Mineral exploration could occur; however, cost to operations would likely increase under some prescriptions to protect the existing conditions to the extent possible. Grazing operations would continue as they currently do, with motorized access and mechanized equipment allowed.

Assignment of prescription 1-1 would not restrict access for mineral and energy resources. Assignment of prescription 8-9 would moderately restrict access for mineral and energy resources. Assignment of prescriptions 8-11, 35-41, 36-42, 39-45, 40-46, 41-47, 42-48, or 43-49 would severely restrict access for mineral and energy resources.

e. Designation: Nonwilderness
Management Emphases: High Intensity Range/Wildlife
Moderate and Low Intensity Range, Wildlife,
and Riparian (No Timber)

Only a small portion of the North Big Hole Roadless Area is assigned these prescriptions in Alternatives B, D, G, H and W; from 1 percent in Alternatives D and G to 4 percent in Alternative B. In Alternative S, the Proposed Action, 25 percent of the area is assigned to these prescriptions.

The effects of implementing these prescriptions will be similar to those described under "Management Emphases: Primitive and semiprimitive recreation/custodial," above. Some vegetative manipulation, such as sagebrush burning for forage improvement, could occur, the impacts of which could have limited impacts on the wilderness capabilities of the area. These impacts would be relatively short-term.



**R17W Roadless Areas** 01421 - SAPPHIRE Bitterroot & Deerlodge National Forests 01808 **MAY 1984** LEGEND ROADLESS AREA BOUNDARY ADJACENT ROADLESS AREA BOUNDARY → MWSA STUDY BOUNDARY (PL 95-150) NON-NATIONAL FOREST OWNERSHIP 01421

### VI. SAPPHIRE ROADLESS AREA

This area is identified by number 01421, the same as in RARE II. Roadless area acreage is:

National Forest	Gross Acres	Net Acres
Bitterroot Deerlodge	44,416 72,614	44,116 72,414
Total	117,030	116 <b>,</b> 530

# A. Description

The area lies along the crest of the Sapphire Mountains in Ravalli and Granite Counties of west central Montana. Hamilton and Philipsburg, county seats, are about 25 miles to the northwest and northeast respectively. The Anaconda-Pintler Wilderness borders the area to the south and the Stony Mountain and Mount Emerine roadless areas are close to the northern boundary. Remaining lands outside the boundary have been developed for minerals and timber production. Access is provided into many points along the boundary from State Highway 38 and from Forest roads in Rock, Copper, Moose, Martin, and Skalkaho Creeks. A network of 17 trails provides access within.

The area has a north-south orientation of about 25 miles with width varying from 2 to 10 miles. Road corridors in Copper Creek and the West Fork of Rock Creek which extend towards the crest of the Sapphires reduce the width of both the northern and southern portions. Practically the entire boundary is midslope, lying above existing roads, timber harvest or mineral development.

Glacial scouring has produced steep, rocky cirque basins and trough walls along the crest and southern boundary. Remaining lands, primarily in the West and Ross Forks of Rock Creek are rolling hills with flat creek bottoms. Moraine and glacial deposits reworked by flowing water characterize most valleys east of the crest. Elevations range from 5,000 feet at some points along the lower boundary to 9,000 feet at Kent Peak. Sixty percent of the area is above 7,000 feet.

Prominent landmarks include Bare Hill, Kent, and Congdon Peaks, and Signal Rock. The Sapphire Mountain crest divides the area into nearly equal parts. Drainages flowing to the east are Copper Creek and the Ross and West Forks of Rock Creek, a nationally recognized trout fishery. Moose, Martin, and Skalkaho Creeks flow to the west and are tributaries of the Bitterroot River. Fifteen small lakes and numerous potholes occur along the crest.

Geology is primarily granite intrusions. Landforms have been modified by past alpine glaciation with soils derived from the parent geology. Streamside meadows break the forested landscape at lower elevations; exposed bedrock and rubble predominate along the Sapphire crest, Whetstone Ridge, and the southern portion bordering the Anaconda-Pintler Wilderness. Douglas-fir and lodgepole pine are the primary tree species with whitebark pine and subalpine larch at the highest elevations. Bunchgrass with scattered Douglas-fir occupies severe south—to west-facing sites. Douglas-fir is common on north exposures at lower elevations and lodgepole pine is common elsewhere. Ground cover is mainly snowberry, nine-bark, and beargrass on drier sites, willow and redosier dogwood on cool moist sites, and grouse whortleberry or wood rush on severe cold sites at higher elevations.

# B. Analysis of Wilderness Suitability

### 1. Wilderness Attributes

# a. Natural Integrity and Appearance

This roadless area has retained a high degree of naturalness, with little evidence of man's imprint. However, on about 3 percent of the area, some impacts are evident.

Old mining prospects and development are found on 250 acres of patented lands. Mining operations continue at Frogpond Basin on the Sapphire crest and just outside the southern boundary near Senate Mountain.

Firelines and primitive roads built during the Sleeping Child Fire are evident in the Martin Creek portion. Those firelines that were built by clearing vegetation are healing rapidly, while dozer cuts on sideslopes have permanently altered the landscape. There are approximately 9 miles of dozer line ranging in width from 15 to 100 feet.

Several roads penetrate the area, including those at Frogpond Basin; along Congdon Creek, Moose Meadows Creek, Lone Pine Ridge, Skalkaho Creek; and firelines in Martin and Moose Creeks.

Both Trout and Kent Lake dams are breached, although application has been made for reconstruction.

There is evidence of past heavy, domestic sheep use on the crest, although the area has mostly recovered and the disturbance would not be evident to most visitors.

# b. Opportunities for Solitude

A core area of about 50,000 acres composed of the Ross Fork of Rock Creek, headwaters of Copper Creek south of the Copper Creek road, Moose Creek, and the headwaters of Skalkaho and Sleeping Child Creeks contain the highest potential for solitude due to good topographic boundaries, size and compactness, and few off-site intrusions.

Civilization appears close at hand near the boundary, most of which is located at midslope, above existing roads, timber harvest, or minerals development.

### c. Primitive Recreation Opportunities

Opportunities exist for hiking, horseback riding, big- and small-game hunting, fishing, and viewing a moderate diversity of vegetation, wildlife, and historic mining activity. The combination of accessible drainage bottoms, gentle ridges, and meadows provides opportunities for cross-country travel.

### d. Other Features

Features include glacial cirques along the Sapphire Mountain crest; historic mining activity; meadows; extensive areas of whitebark pine, subalpine larch and wide panoramas from the major ridges.

### 2. Manageability and Boundaries

The following adjustment in net acres has taken place since the RARE II inventory:

	Nationa	1 Forest	Total
Adjustment	Deerlodge	<u>Bıtterroot</u>	<u>Acres</u>
	_	1	-0.0.
RARE II inventory	56,515	42,300	98,815
Developed or under contract	0	0	0
Land added to inventory	+17,771	0	+17,771
Refined acreage calculation	-1,872	+1,816	<b>-</b> 56
Current inventory	72,414	44,116	116,530

Practically all of the current boundary would be difficult to describe and locate since it is midslope lying above existing roads and/or development. Adjusting boundaries to logical topographic breaks would remove between 40,000 to 50,000 acres from consideration as wilderness; however, doing so would also remove most existing mineral impacts and would measurably improve opportunities for solitude. It would also eliminate many of the fringes which contain the better growing sites for timber and areas of known mineral potential.

A large core area (45 percent of the area) with the highest wilderness attributes has been identified. It is nearly enclosed by high ridgetops which screen out most off-area evidence of civilization, and encompasses most of the Ross Fork of Rock Creek, Copper Creek, Moose Creek, and the upper reaches of Skalkaho Creek. This boundary adjustment enhances the naturalness and solitude, and retains most of the highest primitive recreation attributes and special features. It also removes productive timber lands that are the most physically suited for development. Most nonconforming uses and development near the roadless area boundary would be excluded. Areas of high mineral potential cannot be separated without seriously eroding wilderness potential.

# C. Availability for Wilderness

# 1. Resource Potential and Use

Table C-12 Sapphire Roadless Area Resource Potential and Use

Gross area				est	
Net area         Acres         44,116         72,414         116,           Recreation         Primitive         RVD's         0         0           Semiprim. nonmotor.         RVD's         3,300         3,000         6,           Semiprim. motor.         RVD's         300         4,200         4,           Roaded natural         RVD's         700         0         4,           Waldiffe habitat         Elk deer         500         0         0         0           Summer range         Acres         6,000         3,000         9,         0         0         0         0         0         0         116,         0         0         0         0         0         0         0         0         0         0         0         0         0         1,         116,         0         0         0         0         1,         116,         126,         14,         116,         0         0         0         1,         116,         126,         126,         126,         126,         126,         126,         126,         126,         126,         126,         126,         126,         126,         126,         126,         126,	Category	Unit	Bitterroot	Deerlodge	Total
Recreation         Primitive         RVD's         0         0           Semiprim. nonmotor.         RVD's         3,300         3,000         6,           Semiprim. motor.         RVD's         300         4,200         4,           Roaded natural         RVD's         700         0         4,200         4,           Wildlife habitat         Elk & deer         8         10         0         0         1,000         0         1,000         0         1,000         9,         116,         Wildlife habitat         116,         Wildlife habitat         116,         Wildlife habitat         116,	Gross area	Acres		72,614	117,030
Primitive         RVD's         0         0           Semiprim. nonmotor.         RVD's         3,300         3,000         6,           Semiprim. motor.         RVD's         300         4,200         4,           Roaded natural         RVD's         700         0         4,           Roaded natural         RVD's         700         0         4,           Waldlife habitat         Elk deer         50         0         0         116,           Summer range         Acres         4,116         72,414         116,         116,           Waldlife habitat         Elk deer         0         0         0         0         116,         116	Net area	Acres	44,116	72,414	116,530
Semiprim. nonmotor.   RVD's   3,300   3,000   6,	Recreation				
Semiprim. motor.   RVD's   300   4,200   4,	Primitive	RVD's	=	0	C
Roaded natural   RVD's   700   0	Semiprim. nonmotor.	RVD's	3,300	3,000	6,300
Wildlife habitat     Elk & deer     Summer range	Semiprim. motor.	RVD's	300	4,200	4,500
Summer range   Acres   44,116   72,414   116,   Winter range   Acres   0   0   0     Rocky mountain goat   Acres   6,000   3,000   9,   Bighorn sheep   Acres   1,000   0   1,   Fisheries streams   Miles   26   53   Lakes   Number   8   16   Fisheries lakes   Number   8   16   Fisheries lakes   Acres   60   80   Water developments   Number   0   0   0     Ulivestock range   Current use   AUM's   0   555   Suitable rangeland   Acres   5   25,859   25,   Current allotments   Number   2   4   0   Ulivestock range   Current allotments   Number   2   4   0   Ulivestock range   Current allotments   Number   2   4   Ulivestock range   Uli	Roaded natural	RVD's	700	0	700
Summer range   Acres   44,116   72,414   116,	Wildlife habitat				
Winter range   Acres   6,000   3,000   9,	Elk & deer				
Winter range   Acres   6,000   3,000   9,	Summer range	Acres	44,116	72,414	116,530
Bighorn sheep         Acres         1,000         0         1,           Fisheries streams         Miles         26         53           Lakes         Number         8         16           Fisheries lakes         Acres         60         80           Water developments         Number         0         0           Livestock range         Current use         AUM's         0         555           Suitable rangeland         Acres         5         25,859         25,           Current allotments         Number         2         4         0           Other suitable         Acres         0         0         0           Timber         Tentatively suitable         Acres         27,758         43,466         71,           Standing volume         MMBF         270.3         276.0         54           Corridors         Existing/potential         Number         1         1           Mineral potential         Very high         Acres         0         0           High         Acres         5,420         10,760         16,           Moderate         Acres         23,083         54,144         77.           Mining claims	Winter range	Acres	0	0	C
Bighorn sheep         Acres         1,000         0         1,           Fisheries streams         Miles         26         53           Lakes         Number         8         16           Fisheries lakes         Acres         60         80           Water developments         Number         0         0           Livestock range         Current use         AUM's         0         555           Suitable rangeland         Acres         5         25,859         25,           Current allotments         Number         2         4         0           Other suitable         Acres         0         0         0           Timber         Tentatively suitable         Acres         27,758         43,466         71,           Standing volume         MMBF         270.3         276.0         54           Corridors         Existing/potential         Number         1         1           Mineral potential         Very high         Acres         0         0           High         Acres         5,420         10,760         16,           Moderate         Acres         23,083         54,144         77.           Mining claims	Rocky mountain goat	Acres	6,000	3,000	9,000
Fisheries streams	Bighorn sheep	Acres	1,000	0	1,000
Lakes         Number         8         16           Fisheries lakes         Acres         60         80           Water developments         Number         0         0           Livestock range         Current use         AUM's         0         555           Suitable rangeland         Acres         5         25,859         25,           Current allotments         Number         2         4         0           Other suitable         Acres         0         0         0           Timber         Tentatively suitable         Acres         27,758         43,466         71,           Standing volume         MMBF         270.3         276.0         54           Corridors         Existing/potential         Number         1         1         1           Mineral potential         Very high         Acres         0         0         0         16,           Moderate         Acres         15,613         7,510         23,         16,         16,           Moderate         Acres         23,083         54,144         77,         77,           Oil & gas potential         Very high         Acres         0         0         0 <td></td> <td>Mıles</td> <td>26</td> <td>53</td> <td>79</td>		Mıles	26	53	79
Water developments         Number         0         0           Livestock range         Current use         AUM's         0         555           Suitable rangeland         Acres         5         25,859         25,           Current allotments         Number         2         4         0           Other suitable         Acres         0         0         0           Timber         Tentatively suitable         Acres         27,758         43,466         71,           Standing volume         MMBF         270.3         276.0         54           Corridors         Existing/potential         Number         1         1         1           Mineral potential         Very high         Acres         0         0         0         0           High         Acres         5,420         10,760         16,	Lakes	Number	8		24
Water developments         Number         0         0           Livestock range         Current use         AUM's         0         555           Suitable rangeland         Acres         5         25,859         25,           Current allotments         Number         2         4         0           Other suitable         Acres         0         0         0           Timber         Tentatively suitable         Acres         27,758         43,466         71,           Standing volume         MMBF         270.3         276.0         54           Corridors         Existing/potential         Number         1         1         1           Mineral potential         Very high         Acres         0         0         0         0           High         Acres         5,420         10,760         16,	Fisheries lakes	Acres	60	80	140
Livestock range  Current use	Water developments	Number			C
Current use       AUM's       0       555         Suitable rangeland       Acres       5       25,859       25,         Current allotments       Number       2       4       4         Other suitable       Acres       0       0       0         Timber       Tentatively suitable       Acres       27,758       43,466       71,         Standing volume       MMBF       270.3       276.0       54         Corridors       Existing/potential       Number       1       1         Mineral potential       Number       1       1       1         Mineral potential       Acres       0       0       0         High       Acres       5,420       10,760       16,         Moderate       Acres       15,613       7,510       23,         Low       Acres       23,083       54,144       77,         Mining claims       Number       5       42         Oil & gas potential       Very high       Acres       0       0         High       Acres       0       0         High       Acres       0       0         Moderate       Acres       0	<del>-</del>				
Suitable rangeland         Acres         5         25,859         25,           Current allotments         Number         2         4         4           Other suitable         Acres         0         0         0           Timber         Tentatively suitable         Acres         27,758         43,466         71,           Standing volume         MMBF         270.3         276.0         54           Corridors         Existing/potential         Number         1         1           Mineral potential         Number         1         1           Very high         Acres         0         0         0           High         Acres         5,420         10,760         16,           Moderate         Acres         15,613         7,510         23,           Low         Acres         23,083         54,144         77,           Mining claims         Number         5         42           Oil & gas potential         Very high         Acres         0         0           High         Acres         0         0         0           High         Acres         0         0         0           Moderate	9	AUM's	0	555	555
Current allotments         Number         2         4           Other suitable         Acres         0         0           Timber         Tentatively suitable         Acres         27,758         43,466         71,544           Standing volume         MMBF         270.3         276.0         54           Corridors         Existing/potential         Number         1         1           Mineral potential         Number         1         1           Very high         Acres         0         0           High         Acres         5,420         10,760         16,6           Moderate         Acres         15,613         7,510         23,           Low         Acres         23,083         54,144         77,5           Mining claims         Number         5         42           Oil & gas potential         Very high         Acres         0         0           High         Acres         0         0           High         Acres         0         0           Moderate         Acres         0         0           Low         Acres         0         0           Moderate         Acres					25,864
Other suitable Acres 0 0 0  Timber  Tentatively suitable Acres 27,758 43,466 71, Standing volume MMBF 270.3 276.0 54  Corridors  Existing/potential Number 1 1 1  Mineral potential  Very high Acres 0 0 0  High Acres 5,420 10,760 16, Moderate Acres 15,613 7,510 23, Low Acres 23,083 54,144 77, Mining claims Number 5 42  Oil & gas potential  Very high Acres 0 0 0  Moderate Acres 0 0 0  High Acres 0 0 0  Moderate Acres 0 0 0  Low Acres 44,116 72,414 116,5		Number	2		6
Timber Tentatively suitable		Acres	0	0	C
Tentatively suitable Acres 27,758 43,466 71, Standing volume MMBF 270.3 276.0 54  Corridors  Existing/potential Number 1 1 1					
Standing volume       MMBF       270.3       276.0       54         Corridors       Existing/potential       Number       1       1         Mineral potential       Number       1       1         Very high       Acres       0       0         High       Acres       5,420       10,760       16,         Moderate       Acres       15,613       7,510       23,         Low       Acres       23,083       54,144       77,         Mining claims       Number       5       42         Oil & gas potential       Very high       Acres       0       0         High       Acres       0       0         Moderate       Acres       0       0         Low       Acres       44,116       72,414       116,5		Acres	27.758	43.466	71,224
Corridors       Existing/potential       Number       1       1         Mineral potential       Very high       Acres       0       0         High       Acres       5,420       10,760       16,         Moderate       Acres       15,613       7,510       23,         Low       Acres       23,083       54,144       77,         Mining claims       Number       5       42         Oil & gas potential       Very high       Acres       0       0         High       Acres       0       0         Moderate       Acres       0       0         Low       Acres       44,116       72,414       116,5	<del>-</del>				546.3
Existing/potential Number 1 1  Mineral potential  Very high Acres 0 0  High Acres 5,420 10,760 16,  Moderate Acres 15,613 7,510 23,  Low Acres 23,083 54,144 77,  Mining claims Number 5 42  Oil & gas potential  Very high Acres 0 0  High Acres 0 0  Moderate Acres 0 0  Moderate Acres 0 0  Low Acres 44,116 72,414 116,5	<del>-</del>		-,5	-,	J. 1. 1. 3
Mineral potential         Very high         Acres         0         0           High         Acres         5,420         10,760         16,           Moderate         Acres         15,613         7,510         23,           Low         Acres         23,083         54,144         77,           Mining claims         Number         5         42           Oil & gas potential         Very high         Acres         0         0           High         Acres         0         0           Moderate         Acres         0         0           Low         Acres         44,116         72,414         116,5		Number	1	1	1
Very high       Acres       0       0         High       Acres       5,420       10,760       16,         Moderate       Acres       15,613       7,510       23,         Low       Acres       23,083       54,144       77,         Mining claims       Number       5       42         Oil & gas potential       Very high       Acres       0       0         High       Acres       0       0         Moderate       Acres       0       0         Low       Acres       44,116       72,414       116,5		<del></del>		_	
High       Acres       5,420       10,760       16,         Moderate       Acres       15,613       7,510       23,         Low       Acres       23,083       54,144       77,         Mining claims       Number       5       42         Oil & gas potential       Very high       Acres       0       0         High       Acres       0       0         Moderate       Acres       0       0         Low       Acres       44,116       72,414       116,5	_	Acres	0	0	0
Moderate       Acres       15,613       7,510       23,         Low       Acres       23,083       54,144       77,         Mining claims       Number       5       42         Oil & gas potential       Very high       Acres       0       0         High       Acres       0       0         Moderate       Acres       0       0         Low       Acres       44,116       72,414       116,5					16,180
Low       Acres       23,083       54,144       77,000         Mining claims       Number       5       42         Oil & gas potential       Very high       Acres       0       0         High       Acres       0       0         Moderate       Acres       0       0         Low       Acres       44,116       72,414       116,5	<del>-</del>		<u>-</u> ·		23,123
Mining claims Number 5 42 Oil & gas potential Very high Acres 0 0 High Acres 0 0 Moderate Acres 0 0 Low Acres 44,116 72,414 116,5		_			77,227
Oil & gas potential         Very high       Acres       0       0         High       Acres       0       0         Moderate       Acres       0       0         Low       Acres       44,116       72,414       116,5					47
Very high       Acres       0       0         High       Acres       0       0         Moderate       Acres       0       0         Low       Acres       44,116       72,414       116,9		rumber	,	' <b>-</b>	• ,
High Acres 0 0 0 Moderate Acres 0 0 0 Low Acres 44,116 72,414 116,	<del>-</del> -	Acres	0	٥	0
Moderate         Acres         0         0           Low         Acres         44,116         72,414         116,5			Ξ	Ξ	ő
Low Acres 44,116 72,414 116,			<u> </u>	_	0
			-	_	116,530
TECOES MANDET )			77,110 Q	_	9
			10 225		19,225

### 2. Selected Resource Values

### a. Recreation

Current use in most of the area is very light including big-game hunting, fishing in lakes and major streams, hiking, horseback riding, and viewing subalpine vistas at higher elevations. Approximately 25 percent is motorized use, both trailbike and snowmobile. Big-game hunting along with extensive fishing, hiking, and camping in the Legend Lake complex are the primary uses.

#### b. Wildlife

Elk, mule deer, moose, and black bear are common to the area. Less common are Rocky Mountain goat, bighorn sheep, white-tail deer, and mountain lion. A great diversity of small animals and birds from wolverines, pine marten, golden eagles, pileated woodpecker, to mice and ruby crowned kinglets are permanent or seasonal occupants. Larger streams and lakes support fishable populations of cutthroat, rainbow, and eastern brook trout.

### c. Water

Water from streams flowing west to the Bitterroot River is used for irrigation; however, there are no water developments within the area. Eastward flowing streams contribute greatly to the instream flow on lower Rock Creek, a nationally renowned trout fishery.

# d. Livestock

Suitable lands for grazing are primarily in the eastern portion of the area where three allotments provide about 555 animal unit months of forage. Grazing west of the Sapphire crest consists of cattle drift from Frogpond Basin and from lower elevation lands outside the area.

### e. Ecology

Varied topography, aspect, elevations, precipitation, and past alpine glaciation contribute towards a moderate diversity of ecosystems that are well-represented in existing wilderness. There are no known threatened or endangered species.

### f. Timber

Approximately 60 percent of the area is tentatively suitable for timber production. Standing timber volume is estimated at 546 MMBF. Better timber sites are concentrated at lower elevations and unsuitable lands are along the Sapphire crest.

## g. Minerals and Energy Resources

Many old mines and prospects are found near the margins of intrusive igneous rock. Silver and manganese operations generally follow veins exposed at the surface. Sapphires have also been mined for many years just outside the area to the northeast. Present mining operations within the area are on 250 acres of private land in Frogpond Basin. Hardrock mineral potential ranges from low to high. The Frogpond Basin area is rated high due to existing development.

Signal Rock, the upper Ross Fork, Senate Mountain, Railroad, and Moose Creek areas are rated moderate because of past prospecting and exploration. Although about 20 percent of the area is leased, traditional theories place the oil and gas potential as low.

### h. Cultural

Past minerals activity is of historic interest; however, little else is known about cultural remains.

### 1. Land Use Authorizations

These consist of four outfitter permits and a potential road and utility corridor crossing the Sapphire crest in a low saddle at the head of Railroad Creek.

### 1. Non-Federal Lands

There are several groups of patented mining claim's in Frogpond Basin and several isolated parcels of private land along the eastern boundary.

### k. Other Considerations

## (1) Fire

Fire occurrence is low and the potential for large fires is moderate due to heavy accumulations of down fuel, particularly in lodgepole pine stands that were decimated by mountain pine beetle in the 1930's.

# (2) Insects and Disease

Insects and disease are generally endemic; however, dwarf mistletoe reduces growth in some areas as does spruce budworm, a recurrent pest. There are also areas of high-risk lodgepole pine that will become increasingly susceptible to mountain pine beetle attack.

# D. Need

# 1. Proximity to Existing Wilderness and Population Centers

See Tables C-1 and C-2.

### 2. Contribution to the Wilderness Preservation System

The large meadows in this area are lacking or very rare in other nearby wildernesses. Other ecosystems, communities and wildlife species are well-represented in existing wilderness. Climax forest wildlife such as pine marten and pileated woodpecker and elk, goat, and other big-game animals would benefit from the unroaded security provided in wilderness.

# 3. Public Interest

About 16 percent of responses on the RARE II DEIS favored wilderness, 43 percent nonwilderness and 41 percent further planning. The majority of local publics supported nonwilderness in the unit planning process although not necessarily development options. In that process there appeared to be strong local support for unroaded management for a sizeable portion of the area but with less restrictions than for wilderness.

In the 1983 roadless area public involvement, most of the comments supported wilderness to protect watershed, hunting, fishing, elk sanctuary, uniqueness, and because of its proximity to the Anaconda-Pintler Wilderness. Comments stated the area is more valuable for watershed and game range than for timber. The nonwilderness comments favored timber, minerals and snowmobile use.

Eighty-one percent of the area is a congressionally designated wilderness study area (P.L. 95-150). The Montana State Bill (S. 2850) does not address this area.

The majority of comments on the Bitterroot Forest Plan DEIS opposed any semiprimitive or wilderness designations. The primary reasons are: to assure an adequate supply of logs to mills as a vital part to the Bitterroot's economy: there is more than adequate existing wilderness; and to maintain motorized recreation use. Most of these respondents did not mention specific roadless areas, whereas those opposed to development did. Comments specific to this roadless area favored roadless designation, mostly wilderness, stating that: the area is adjacent to the Anaconda-Pintler Wilderness; elk, deer, goats, and fish habitat should be protected; and scenic quality should be protected. Snowmobile and trailbake users favored a semaprimitive recreation designation for at least the use corridors in the headwaters of Skalkaho, Divide and Moose Creeks. primary reasons are: this is one of the areas on the Bitterroot Forest with the right combination of access, slope and open area for enjoying snowmobile and trailbike use in a relatively natural setting; and it provides a corridor between the Bitterroot and Flint Creek Valleys. The Frog Pond Basin area should be excluded from wilderness designation.

The response to the 1985 Deerlodge Forest DEIS and Proposed Forest Plan was heavy support for wilderness from one segment of the public. Other comments supported the designations in the Forest Plan or were opposed to any new wilderness.

Testimony at the Montana Wilderness Study Act hearings (P.L. 95-150) in December of 1985 was mixed, with the Hamilton hearing favoring wilderness and the Philipsburg hearing favoring development. A summary of the testimony follows:

Wilderness Designation - The majority of respondents favor wilderness designa-The Sapphire area, together with the Anaconda-Pintler Wilderness and other roadless lands, constitutes the fifth largest wild area in Montana and needs protection as a complete ecosystem. The Sapphire area has more gentle terrain and is more accessible to people who cannot hike the rugged Anaconda-Pintler Wilderness, so it complements the existing wilderness and is a logical The Sapphire area has an abundance and variety of wildlife and is a high quality hunting area in Montana, the cornerstone of elk hunting. drainages are all high quality watersheds. The relationship of forest cover to early snowmelt and the local dependence on irrigation water was a reason against development cited by some. The Sapphire area was cited by many as important in maintaining water quality and trout fisheries in Rock Creek and tributaries of the Bitterroot River. Timber sales would be at a cost to the taxpayer. respondents stated that 90 percent of the Sapphire area is in the lowest productivity class. Tourism and outdoor-based recreation are important, growing sectors in Montana's economy and depend on clean water and undeveloped wild areas Sapphire has outstanding wilderness attributes. including to draw visitors. opportunities for solitude, natural beauty and scenic diversity. There is a need for wilderness nationally, and only 3 percent of Montana is currently designated wilderness. There is a need to preserve the area for future generations to decide whether there are sufficient opportunities for primitive recreation. Logging and road building would cause erosion and irreparable damage to the area, to wildlife and their habitat, to water quality and fisheries, and to the scenery and backcountry recreation.

Developed Management - About 16 percent of respondents favor developed management for the area. There is much wilderness within easy access of Hamilton and the Bitterroot Valley. Granite County has enough, as does Montana. 22 percent of Montana's timbered area is designated wilderness. Wilderness does not satisfy a real need of the public, but a desire. Wilderness has no economic benefits and causes the loss of jobs in the wood products industry, a major part of the economies of Ravalli and Granite Counties. These economies are already depressed and the Forest Service has a responsibility to supply local mills with timber. Only part of the population can use wilderness, those who can walk, while a multiple-use forest can be used by everyone. According to Forest Service estimates, only 9 percent of Forest recreation users are in wilderness In a 1982 poll of Montanans, only 11 percent of residents had visited a wilderness area that year. Development of other Forest areas has not caused damage to the environment, given the current numbers of big game and the quality of water and trout fisheries. The area does not have the characteristics to qualify it as wilderness.

<u>Timber/Roads</u> - About 30 percent of respondents commented about timber and roads. The most frequent was that the timber was of low quality, cannot be harvested on a positive cost-benefit basis, and would require taxpayer subsidies for road building. Other respondents argue that the timber can be profitably harvested; that in fact, there are very highly productive timber growing sites in this area. They also cited the number of jobs in the local timber industry and the dependency on timber from this area. Several respondents stated that the current depressed market and economic situation for the local timber industry is a more complex problem than wilderness designation of roadless lands. Other respondents feel that past designation of land to wilderness has been the cause of the present supply problem.

Recreation Use - About 20 percent of respondents commented about recreation Many of the comments stated that there were many opportunities other than the Sapphire area for 4-wheel drives, snowmobiles, and trailbikes. Most of the comments from snowmobilers said that the area was used extensively. spondent said few snowmobilers used the area. Most snowmobile users cited the lack of areas open to them, the suitability of the Sapphire area for snowmobiling, that it was a historic use, and that snowmobiles do not cause damage. One respondent indicated that only 11 percent of the Bitterroot Forest-would be accessible to snowmobiles. Another respondent indicated that there are historic uses other than snowmobiling of the Sapphire area, including hunting, fishing, hiking and wildlife habitat. Another indicated that the Forest Service is at fault for allowing such use in a study area when the 1978 Forest Service evaluation gave the area a high score for wilderness attributes. In addition to snowmobile use, several respondents indicated that the Sapphire area is heavily used by motorcycles and all-terrain vehicles, and is a popular 4-wheel drive hunting area. Although snowmobilers stated that they cause no damage, several other respondents disagreed.

<u>Wildlife</u> - Comments centered on the variety and abundance of wildlife. The Sapphire area was said to have both summer and winter range for elk, some of the finest in the country, and to provide security habitat in an area surrounded by roaded and logged areas. It is also home for lynx, wolverine, pine marten, moose, deer and black bear. The area is said to have quality elk hunting.

Economics - Many of the comments on economics were from respondents opposed to taxpayer-subsidized timber sales. Several respondents indicated they depend on the area for their livelihood: from trapping with the use of chain saws and snowmobiles, to grazing livestock. A number of comments were concerned with the local economy, jobs, tax base, and monies paid to the counties and state based on timber harvest levels. The growing tourism-recreation industry, dependent on wilderness areas to draw visitors to Montana, was also cited. Roadless areas will increase in value in the future, stated several respondents.

<u>Water Quality/Fisheries</u> - The Sapphire area is a vital watershed for Rock Creek and the Bitterroot River, including important trout-spawning tributaries. Several comments were that forests retard snowmelt and runoff, which is important for irrigation and local agriculture.

Minerals - The majority of comments on minerals cited the importance of mining to the local economy, especially in Granite County. The Sapphire area was said to have demonstrated potential for gold, silver, lead, copper and zinc; and Frog Pond, Copper Creek, Green Canyon and Moose Lake have deeded mining claims. One respondent indicated that the Forest Service does not have the data available to determine if energy exploration would be insignificant. Another requested that no oil or gas leases be permitted in this area in the final Forest Plan.

 $\underline{\text{Soils}}$  - Comments described the area as sensitive, fragile, with erodible soils and short growing seasons.

<u>Livestock</u> - Comments were few, and centered on the importance of ranching to Granite County's economy and the dependence of several individuals on livestock permits in the Sapphire area. One respondent has permits in Frog Pond Basin, Copper Creek, Green Canyon, and Moose Lake, and stated that his ranch would become totally inoperable if the area became wilderness.

Boundaries - Several respondents commented on the boundaries on the northern end of the Sapphire area in the Medicine Lake area. Some felt that the Medicine Lake Trail was a good boundary, others favored the Medicine Lake Road. One stated that the proposed boundary was "gerrymandered" to exclude public roads and private mining claims, and would create an administrative nightmare for the Forest Service.

# E. Alternatives and Environmental Consequences

# 1. Management Emphasis by Alternative

Management prescriptions providing for roads have been grouped into a roaded management emphasis since roading will preclude wilderness classification. Management prescriptions that do not provide for roads, except for possible mineral entry, are identified under an unroaded management emphasis. In this emphasis, timber sale activity or range development would preclude wilderness in the short term, but not necessarily in the long term. The semiprimitive recreation emphasis will maintain the roadless character.

Similar alternatives for the Deerlodge National Forest have been matched with those on the Bitterroot. Table C-13 displays total acreage assignment by management emphasis, and development by decade, for matched Forest alternatives. Table C-14 shows suitable timberland and mineral potential acreage, by management emphasis and alternative.

Section E2 uses Bitterroot Forest alternative names but describes the entire roadless area.

Table C-13
Management Emphasis (Sapphire)
(thousand acres)

Management		-								A	lte	rnatı	ve-								
Emphasis Bit	terroot	A		В	<b>\$</b>	C	;	E		Ε	1		ΕZ	F	,	C	}	н		J	ŗ
De e	rlodge	С			:	L		M		٨	ı	<del></del>	M-1	A		E	1	ĸ		J	۲ 
Nonwilderness designation		116	_	116	-	106	2	116	5	116	_	116	5	116		62	2	24	0		•
Roaded Emphasis		70	8	70	8		8	30	-	26	1	24	9	L	5	39	9	14	1		
Bitterroot Forest		33	3	33	3	26	0	17	4		4	15	8		0	17	4	1	2		
Deerlodge Forest		37			5		8	12	6	8	7	9	1	L	5	22	5	12	9		
Unroaded Emphasis		4	7	4	7	4	7	4	7	6	1	9	2	4	7	6	1		5		
Bitterroot Forest			0		0		0		0		0		8		0	1	4		0		
Decrlodge Forest		4	7	4	7	4	7	4	7	6	1	8	4	4	7	4	7		5		•
Semiprimitive recreation E	mphasis	41	0	41	0	41	7	81	8	84	3	82	4	107	4	16	2	9	4		(
Bitterroot Forest		10	8	10	8	15	6	26	7	26	7	27	5	44	1	4	9	6	9		(
Deerlodge Forest		30	2	30	2	26	1	55	1	57	6	54	9	63	3	11	3	2	5		(
Wilderness designation			0		0	10	4		0		0		0		0	54	4	92	5	116	. :
Bitterroot Forest			0		0	2	5		0		0		0		0	20	4	36	0	43	
Deerlodge Forest			0		0	7	9		0		0		0		0	34	٥	56	5	72	ı
Area developed by																					
Decade 1		18	7	10	8	9	1	9	8	12	0	1	1	1	1	5	6	2	6		c
Bitterroot Forest		16	2	8	3	6	5	8	7	11	5		5		0	3	8		٥		(
Deerlodge Forest		2	5	2	5	2	6	1	1		5		6	1	1	1	8	2	6		(
Decade 5**		75	5	75	5	64	4	34	6	32	2	24	9	9	2	46	0	14	7		(
Bitterroot Forest		33	3	33	3	26	0	17	4	17	4	15	8		0	18	8	1	2		C
Deerlodge Forest		42	2	42	2	38	4	17	2	14	8	9	1	9	2	27	2	13	5		c
rea roadless in *																					
Decade 1		97	8	105	7	97	0	66	2	104	5	115	4	115	4	56	5	21	4		(
Bitterroot Forest		27	9	35	8	35	1	35	4	32	6	43	6	44	1	19	9	8	1		(
Decrlodge Forest		69	9	69	9	61	9	71	3	71	9	71	8	71	3	36	6	13	3		c
Decade 5**		41	0	41	0	41	7	81	9	84	3	91	7	107	3	16	6	9	3		ľ
Bitterroot Forest		10	8	10	8	15	6	26	7	26	7	28	4	44	_	4	9	6	•		Č
Deerlodge Forest		30	2	30	2	26		55	2	57	6	63	3	63	_	16	-	2			ď
urrent roadless acres		116	5	116	5	116	5	116		116		116	•	116		116	-	116		116	-
Bitterroot Forest		44	1	44	1	44	-	44	-	44	-	44	-	44	_	44	-	44	-	44	•
Deerlodge Forest		72	Ц	72	ь	72		72		72		72	_	72	_	72		72	-	72	-

<sup>\*</sup> Does not include wilderness designations

Table C-14
Suitable Timberland and Mineral Potential (Sapphire) (thousand acres)

Management						Alte	rnative				- <b></b>
Emphasis Bit	tterroot	A	В	C	Ė	E1	E2	F	G	H	J
Dee	erlodge	С	c	L	M	N	M-1	Α	Е	K	J
Tentatively suitable land											
Roaded emphasis		65 3	65 3	57 <sup>2</sup>	25 <b>7</b>	21 8	21 2	4 5	34 6	13 8	
Bitterroot Forest		27 8	27 8	23 4	13 1	13 1	12 1	o	12 1	9	(
Deerlodge Forest		37 5	37 5	33 8	12 6	8 7	9-1	45	22 5	12 9	1
Unroaded emphasis		5	5	5	5	6	5	5	15	0	(
Bitterroot Forest		0	0	0	0	0	0	0	1 0	0	(
Deerlodge Forest		5	5	5	5	6	5	5	5	0	(
Semiprimitive recreation e	mphasis	5 5	5 5	8 4	45 1	48 9	49 6	66 3	8 2	6 0	(
Bitterroot Forest		0	0	3 2	14 7	14 7	15 7	27 8	25	48	(
Deerlodge Forest		5 5	5 5	52	30 4	34 2	33 9	38 5	5 7	1 2	(
Wilderness emphasis		0	0	52	0	0	0	0	27 0	51 5	70 9
Bitterroot Forest		0	0	1 2	0	0	0	0	12 2	22 1	27
Deerlodge Forest		0	0	4 o	0	0	0	0	14 8	29 4	43 9
High mineral potential											
Roaded emphasis		8 0	8 0	48	18	1 8	1 8	1 0	24	1 0	c
Bitterroot Forest		45	45	1 3	0	0	0	0	0	0	c
Deerlodge Forest		3 5	3 5	3 5	18	18	1 8	1 0	24	1 0	C
Unroaded emphasis		0	0	0	0	0	0	0	0	0	o
Bitterroot Forest		0	0	0	0	0	0	0	0	0	0
Deerlodge Forest		0	0	0	0	0	0	0	o	0	O
Semiprimitive recreation e	mphasis	8 6	8 6	11 1	14 7	14 7	14 7	15 6	0	٥	0
Bitterroot Forest		13	1 3	38	58	58	58	58	0	0	a
Deerlodge Forest		7 3	7 3	7 3	8 9	8 9	8 9	98	0	0	O
Wilderness emphasis		0	0	7	0	0	0	0	14 2	15 6	16 6
Bitterroot Forest		0	0	7	0	0	0	O	58	58	5 8
Deerlodge Forest		0	0	0	0	0	0	0	8 4	98	10 8

# 2. Impacts

a. Designation: Wilderness
Management Emphasis: Wilderness

Virtually the entire area is recommended for wilderness in Alternative J, with recommendations of 9, 47, and 79 percent in C, G, and H respectively. Recommendations would expand the wilderness system as a new wilderness or as additions to the Anaconda-Pintler Wilderness. Alternatives C and G incorporate portions of the area having high wilderness attributes, and H and J include additional land with low to moderate attributes.

Timber production is precluded on tentatively suitable land--all in Alternative J, and 7, 38, and 72 percent in C, G, and H respectively. All tentatively suitable timberland amounts to 5 percent of the Forest total for the Bitterroot and 7 percent for the Deerlodge Forests.

Wilderness classification precludes semiprimitive recreation emphasis designation in Alternative J and reduces the acreage available in C, G, and H. Recreation use will continue to be dominated by hunting, fishing, and camping. Mechanized trailbike, snowmobile, and chain saw use would be prohibited.

Mineral exploration and development is foreclosed subject to valid existing rights. All land rated as having a high mineral potential is withdrawn from mineral entry in Alternative J and 4, 86, and 94 percent in C, G, and H respectively.

Current livestock use would continue.

Nonpriced benefits and costs include:

- A natural level of visual quality is maintained.
- The wilderness system expanded.
- A natural level of big-game forage and cover is maintained. Cover/forage ratios would be determined by natural events such as wildfire.
- Vegetative diversity tends toward old growth as modified by a more nearly natural role for wildfire.
- Old-growth dependent wildlife species are favored.
- Natural levels of watershed and fisheries are maintained.
- Local wood products employment decreases in Alternatives H and J, remains stable in G, and increases in C.

Economic and social effects vary depending on the amount of tentatively suitable timberland recommended for wilderness. The wood products and mining industries would not be supported by this emphasis. However wilderness could enhance primitive and semiprimitive recreation opportunities and outfitter activities. Publics interested in wilderness opportunities would be supported, whereas those favoring mechanized use in a natural setting would not.

# b. Designation: Nonwilderness Management Emphasis: Roaded

Timber, range, partial retention, and riparian prescriptions are in this emphasis. Some land is included in this emphasis in all alternatives except J. The highest level is in A and B with about 61 percent of the roadless area, and the lowest is in F at 4 percent.

Ninety-two percent of the tentatively suitable timberland is included in this emphasis in Alternatives A and B; 80 percent in C; from 19 to 49 percent in Alternatives E, E2, G, and H; and 6 percent in F. High-value old growth is scheduled for early removal; however, due to long rotations old growth will be retained above the minimum level in partial retention and riparian prescriptions. Early harvest is also scheduled in lodgepole pine stands which blanket much of the area.

Roads and timber harvest will foreclose future consideration for wilderness by the end of the fifth decade; however, over 80 percent of the land in this emphasis will remain unroaded and undeveloped at the end of decade 1. The roadless character changes as roads reduce naturalness and solitude. Semiprimitive recreation use would be disrupted as the recreation setting changes to roaded.

Access for mineral and energy exploration is enhanced as the road system expands. Land of high mineral potential would be 48 percent accessible in Alternatives A, and B; 29 percent in C; and from 6 to 14 percent in E, E2, F, G, and H.

Transitory forage for livestock and wildlife is created by timber harvest.

Nonpriced benefits and costs include:

- Visual quality will be at the lowest level (maximum modification) in Alternatives A, B, and H and the highest level (partial retention) in G.
- Characteristics for future consideration as wilderness are foregone by the end of the fifth decade.
- Security cover for elk and other game will be greatly reduced in Alternatives A, B, C, and H; however, road closures will mitigate this effect
- Vegetative diversity tends toward younger age classes in Alternatives A, B, C, E, and H, but retains a sizeable old-growth component in E2, F, and G.
- Water quality is reduced but mitigated by high road construction and maintenance standards.
- Local wood products employment is increased significantly in Alternatives A, B, and C; and remains stable in E, E2, G, and H.

Economic effects vary depending upon the amount of land that is suitable for timber production and the degree of constraints for visual and watershed values. The greatest positive effect is for Alternatives A, B, and C where most tentatively suitable land is retained in the timber base with few constraints to recognize other values. The wood products and mining industries are supported by this emphasis. Publics favoring roadless or wilderness characteristics would not be supported; however, much of the area would remain like it is for another

10 years. Those publics using the area for semiprimitive recreation would have to adjust to a roaded setting or shift use elsewhere. Outfitters could continue operations although the hunting experience would be altered.

# c. Designation: Nonwilderness Management Emphasis: Semiprimitive Recreation

The semiprimitive recreation prescription is in this emphasis on the Bitterroot, and the recreation prescription on the Deerlodge. Some land is included in this emphasis in all alternatives except J. The highest level is in F which incorporates all land within the MWSA boundary, and the lowest is in H at 8 percent. In A and B, lands assigned this emphasis are relatively large high elevation blocks that are not suitable for timber production.

Except for possible mineral entry, roadless characteristics for a core area in Alternatives C, E, E2, F, G, and H will be retained and the land will remain available for future consideration as wilderness. Besides the roadless character, wilderness attributes of naturalness and solitude will also be maintained. Current recreation use will continue. Trailbike, snowmobile, and chain saw use is compatible with this emphasis.

Current levels of livestock use would continue.

Cover/forage relationships for wildlife will be determined by natural events such as wildfire but can be modified by prescribed fire or direct habitat improvement.

Roads are not needed for surface management purposes but will be permitted for mineral activities where construction is justified on the basis of mineral showings or data, and where it is the next logical step in the development of the mineral resource. Fifty-two percent of those lands having a high mineral potential are in this emphasis in Alternatives A and B and 67, 89, and 94 percent in C, E (and E2), and F respectively.

Timber production is precluded on 12, 65, 76, 93, 12, and 8 percent of the tentatively suitable timberland in Alternatives C, E, E2, F, G, and H respectively. Tentatively suitable land in Alternatives A and B is not efficient for timber production, and in C and G is primarily of low site quality. Alternatives E and E2 incorporate lands of higher site quality, much of which would be difficult to develop because of low product values and/or difficult terrain.

Nonpriced benefits and costs include:

- A near natural level of visual quality is maintained.
- The wilderness option is retained for future consideration.
- Near natural cover/forage ratios for big game are retained but may be modified by prescribed fire or other direct habitat improvement.
- Vegetative diversity tends toward old growth but may be modified by prescribed fire.
- Old-growth dependent wildlife are favored.
- Natural levels of watershed and fisheries are retained.
- The current recreation use is retained.
- Local wood products employment should be retained at current levels in Alternatives E and E2; and would increase in A, B, C, and G.

Economic and social effects vary depending on the amount of tentatively suitable timberland in this emphasis. The effect is greatest in Alternatives E, E2, and F; no effect in A and B; and little in C and G. The wood products and mining industries are not supported by this emphasis. Miners could continue to operate; however, costs would be higher without road access. Land would remain much like it is currently, thus supporting current recreation use, livestock grazing, and outfitters.

d. Designation: Nonwilderness
Management Emphasis: Unroaded

The unroaded retention prescription is in this emphasis on the Bitterroot, and the range and wildlife prescription on the Deerlodge. Four to 8 percent of the roadless area is in this emphasis in Alternatives A, B, C, E, E1, E2, F, and G.

Timber harvest forecloses future consideration for wilderness by the end of the fifth decade, at least in the short term. Most land would remain available for wilderness at the end of the first decade. Current recreation use would be maintained.

From 1 to 2 percent of the tentatively suitable timberland is included in this emphasis in Alternatives A, B, C, E, E1, E2, F, and G. High-value old growth is scheduled for early removal; however, due to long rotations, significant old growth will be maintained. This emphasis is not cost efficient since timber harvest is limited to expensive aerial systems.

Mineral exploration and development is an appropriate use but would be difficult due to lack of road access. No lands rated as high mineral potential are included in this emphasis.

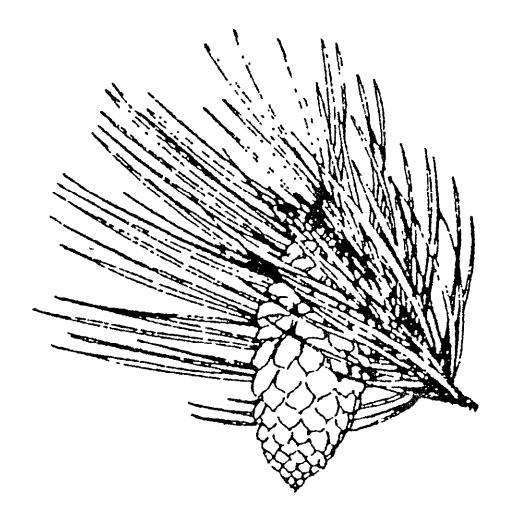
Transitory forage for livestock and wildlife is created by timber harvest.

Nonpriced benefits and costs include:

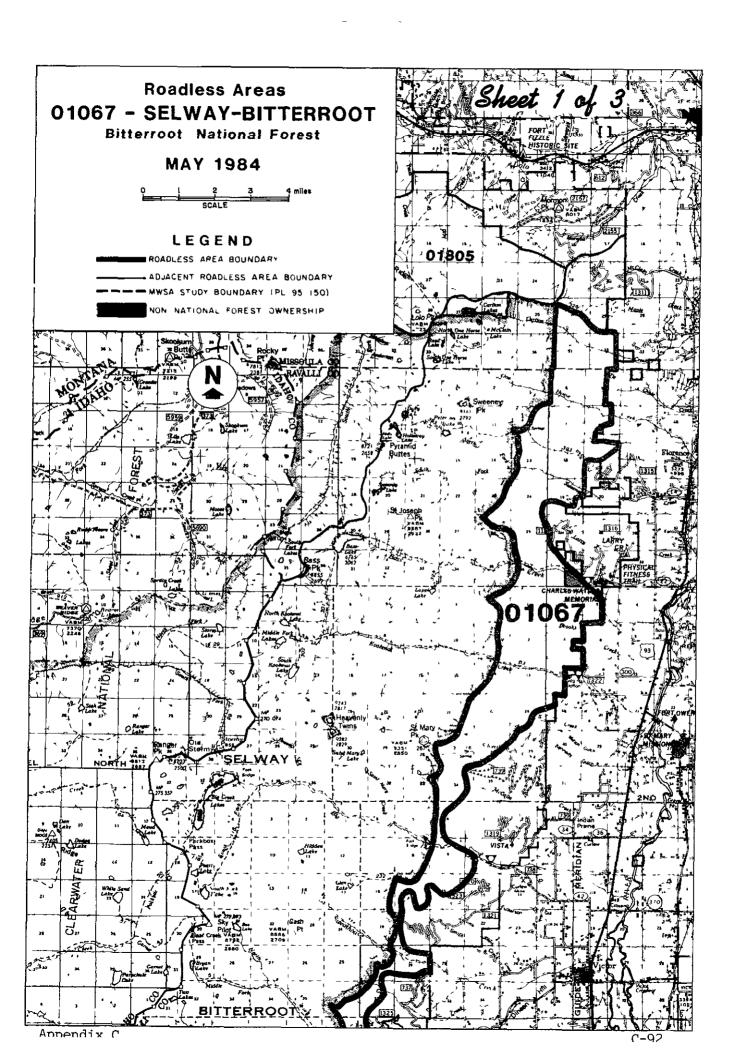
- A high level of visual quality will be retained.
- Future consideration for semiprimitive recreation will be retained.
- Vegetative diversity tends toward a balance in age classes including old growth.
- Water quality and fisheries remain at high levels.
- Unroaded big-game security areas are retained.
- Present recreation opportunities are maintained.

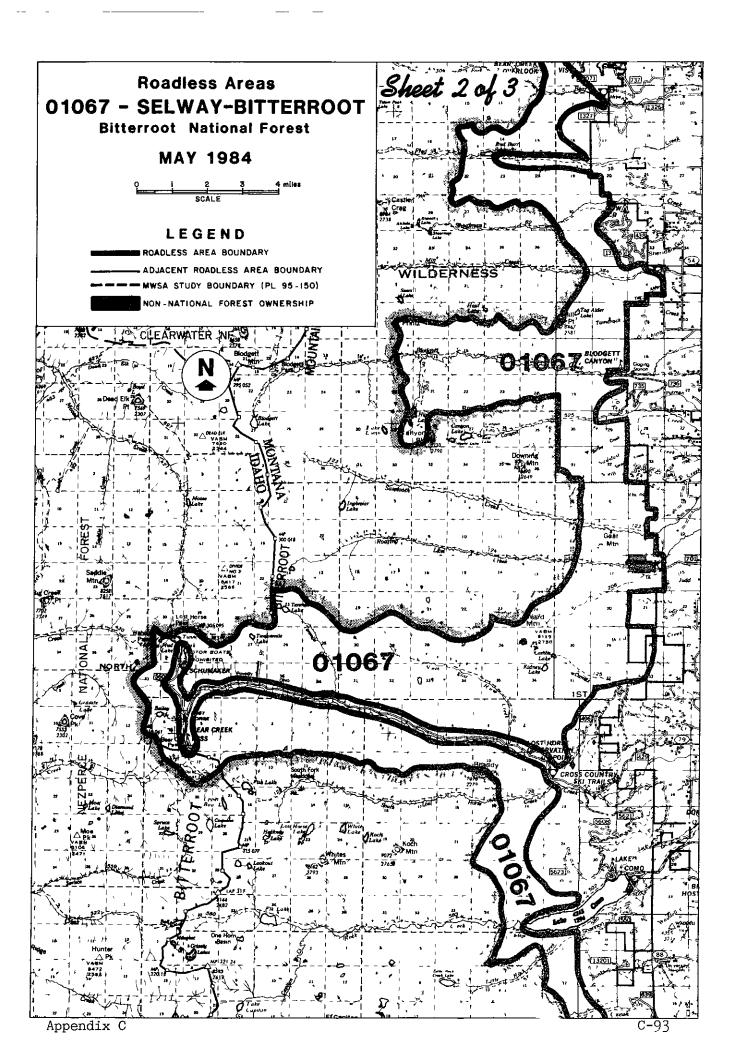
From a social and economic standpoint, timber is available, thus supporting the wood products industry. Mining is compatible with the emphasis although costs would be high without road access. Although the naturalness of the area would be impacted, the roadless character would be retained, thus supporting current semiprimitive recreation uses, and future consideration as wilderness.

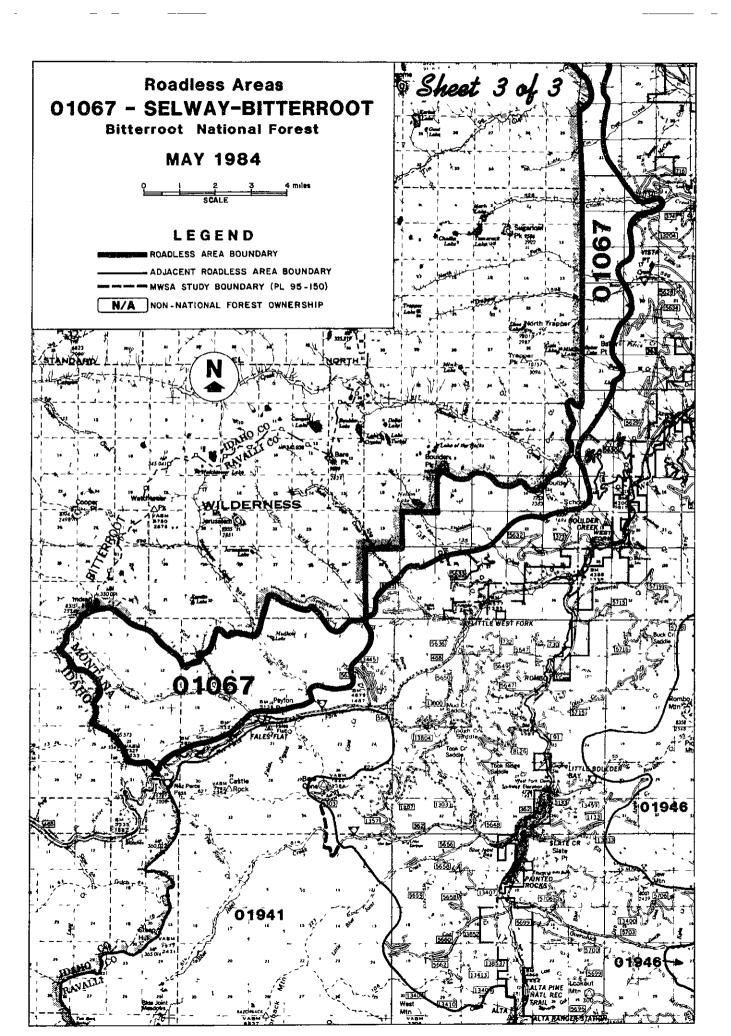
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# VII. SELWAY-BITTERROOT ROADLESS AREA

This area is identified by number 01067. The RARE II numbers were 01061, 01062, 01063, 01064, A1BAA, S1BAA, and M1845.

Roadless area acreage is:

National Forest	Gross Acres	Net Acres
Bitterroot	115,331	115,151
Nez Perce	600	600
Total	115,931	115,751

#### A. Description

This long, narrow roadless area borders the west edge of the Selway-Bitterroot Wilderness in Ravalli County in west central Montana. The eastern boundary abuts private land near the valley floor or lies above roads and timber harvest at midslope. Hamilton is about 4 miles east of the area's center. Access to the boundary is provided at many points via county or Forest roads which connect with U.S. Highway 93, and State Highway 473 to the east. About 40 trails, mostly following major stream courses, provide access to the adjoining wilderness.

The 75-mile-long roadless area forms the eastern edge of the Bitterroot Mountain Range which rises sharply from the wide Bitterroot Valley. It varies in width from 6 miles to less than a mile. Elevations range from 4,000 to 9,800 feet with about 33 percent of the area over 7,000 feet. The range of impressive mountain peaks at or above 8,000 feet and spectacular rugged canyons at about 4,000 feet form a scenic backdrop for travelers and 25,000 valley residents. About 30 deep, rocky, glaciated canyons break the mountain front at 1- to 3-mile intervals. These canyons are major access points to the Selway-Bitterroot Wilderness.

Plant and animal communities are diverse because of the topographic variation from mountain peak to valley bottom. Bedrock and rubble dominate many canyon sidewalls, steep southwest-facing slopes, and higher elevations. Forests cover most north and east slopes and riparian areas. Major stream riparian areas support cedar, grand fir, and an occasional white pine along with mixtures of ponderosa pine, Douglas-fir and larch. Midslopes support subalpine fir and lodgepole pine with whitebark pine or subalpine larch predominating at higher elevations.

Ground cover is mainly grass on steep south- to west-facing slopes; snowberry and ninebark on lower elevation relatively dry sites; willow, alder, and a rich diversity of other shrubs on moist sites; true huckleberry at midslope; and grouse whortleberry and wood rush at higher elevations.

Generally people value the area's scenery and recreation opportunities. Day hiking, fishing in streams and lakes, big-game hunting, rock climbing, crossing through to the adjacent wilderness, and ski touring are frequent uses in the canyons.

Also important to the valley is the use of water from streams for irrigation.

There is one small storage dam and reservoir in this roadless area and 17 others in adjacent wilderness.

## B. Analysis of Wilderness Suitability

#### 1. Wilderness Attributes

### a. Natural Integrity and Appearance

The impacts of human activity are confined to six canyon bottoms. The impacts cover less than 500 acres including reservoir drawdowns. These include a dozer-constructed trail in Bass Creek; a small irrigation dam and reservoir at High Lake; two small abandoned irrigation dams at Kidney and Lower Camas Lakes; an old jeep trail in the South Fork of Lost Horse; reservoir drawdown on Como, Upper Twin, and Fred Burr Lakes; irrigation diversion and ditch in the head-waters of Bear Creek (Nez Perce); a dozer trail and minerals prospecting in the North Fork of Trapper Creek; a cabin on Larry Creek; several trail bridges and corduroy sections across boggy sections of trail; and isolated pockets of heavy recreation use along major trails. A road in Lost Horse Canyon is outside the roadless area boundary but does impact some of the surrounding canyon.

Impacts are widely dispersed but evident to most visitors when onsite. However, because of the small amount of land affected, the area has a high rating for natural appearance, even in those canyons where impacts occur. In addition, most of the 400 acres of reservoir drawdown is around Lake Como and could easily be eliminated from any wilderness recommendations.

## b. Opportunities for Solitude

Civilization appears to be close at hand from the mountain faces overlooking the Bitterroot Valley, and sights and sounds from the valley floor are evident. Conversely, 30 canyon mouths offer a high degree of solitude since most are enclosed by adjacent parallel ridges which provide an effective screen from outside influences. A high degree of solitude is found within a few feet of trailheads. This feeling is enhanced by the knowledge that more than 40 miles of wilderness lie ahead.

#### c. Primitive Recreation Opportunities

Hiking; rock climbing; fishing; viewing a wide diversity of vegetation, wild-life, rock formations, avalanche chutes, waterfalls, and lakes; big- and small-game hunting; scenic cross-country opportunities are abundant. The sharp relief contributes towards the feeling of vastness. Climatic zones range from wet and cold with over 100 inches of precipitation at high elevations to dry and warm at lower elevations.

#### d. Other Features

Special features include a natural arch in Blodgett Canyon, a massive landslide across Nelson Creek that formed Nelson Lake, waterfalls, abundant and varied rock formations, and historical evidence of irrigation dam construction around the turn of the century.

#### 2. Manageability and Boundaries

RARE II areas 01061 through 01064, A1BAA, S1BAA and the Montana portion of M1845 comprise the roadless area. The following adjustment in net acres has taken place since the RARE II inventory. Also, acreage has been added between the Draft and Final EIS due to cancellation or deferment of several timber sales.

Adjustment	National <u>Bitterroot</u>	Forest Nez Perce	Total <u>Acres</u>
RARE II inventory	221,700	0	221,700
Added to wilderness (P.L. 96-312)	-105,600	0	-105,600
Developed or under contract	-4,238	0	<b>-</b> 4,238
Land added to inventory	+120	+600	+720
Refined acreage calculation	+3,169	0	+3,169
Current inventory	115,151	600	115,751

The adjoining Selway-Bitterroot Wilderness is about 1,338,000 acres. Approximately one-fourth of the existing wilderness boundary on this Forest is poorly defined, either following projected section lines or traversing topography that cannot be described nor identified on the ground. There is an opportunity to adjust the boundary by selecting good topographic features within the roadless area and recommend wilderness for those lands which are considered to be an integral part of the wilderness, e.g., major canyon mouths. This would markedly improve the manageability of lands, both within and outside wilderness.

A large core area containing many canyon mouths (45 percent of the area) and having high wilderness characteristics has been identified. The canyons are enclosed by high ridgetops which effectively screen out most off-area evidence of civilization. Canyon mouths include Watchtower, Sheephead, Nelson, Boulder, Trapper, Chaffin, Tin Cup, Little Rock, South and North Forks of Lost Horse, Roaring Lion, Sawtooth, Blodgett, Mill, Bear, Kootenai, Sweeney and Bass Creeks. The boundary adjustment would enhance the area's naturalness, solitude, and retain the highest primitive recreation attributes and special features. Solitude is also enhanced by the adjoining wilderness. The adjustment would contribute towards a much better wilderness boundary following readily identifiable topographic features. It would also remove most of the nonconforming uses and development near the roadless area boundary. Land with high mineral potential and more productive timber lands that are the most suited for development would be eliminated from wilderness consideration.

The roadless area is National Forest except about 180 acres of state and private lands along the boundary in Roaring Lion and Bass Creek drainages. Nonconforming uses include trailbike, snowmobile, and chain saw use, and helicopter landings for dam and reservoir maintenance. Bass, Big, Fred Burr, Blodgett, Trapper Peak, Boulder, Nelson Lake, Soda Springs, and Watchtower trails are closed to trailbike and snowmobile use. Other trails and the remainder of the area are open; however, steep rocky terrain and vegetation generally preclude such use except for short distances adjacent to trailheads.

Known mining claims are confined to a small group of claims in Trapper Creek. Also, approximately 13,626 acres north of Trapper Creek but outside RARE II wilderness recommended areas are covered by 17 oil and gas leases.

# C. Availability for Wilderness

# 1. Resource Potential and Use

Table C-15 Selway-Bitterroot Roadless Area Resource Potential and Use

		For		
Category	Unit	Bitterroot	NezPperce	Total
Gross area	Acres	115,331	600	115,931
Net area	Acres	115,151	600	115,751
Recreation				
Primitive	RVD's	0	0	0
Semiprimitive nonmotor.	RVD's	7,750	0	7,750
Semiprimitive motorized	RVD's	750	50	800
Roaded natural	RVD's	1,500	100	1,600
Wildlife habitat				
Elk & deer			_	
Summer range	Acres	104,447	600	105,047
Winter range	Acres	13,116	0	13,116
Rocky mountain goat	Acres	15,000	0	15,000
Bighorn sheep	Acres	6,000	0	6,000
Fisheries streams	Miles	65	1	66
Lakes	Number	14	1	15
Fisheries lakes	Acres	555	5	560
Water developments	Number	1	0	1
Livestock range				
Current use	AUM's	0	0	.0
Suitable rangeland	Acres	1,187	0	1,187
Current allotments	Number	2	0	2
Other suitable	Acres	0	0	0
Timber	_	1	^	
Tentatively suitable	Acres	40,907	85	440,992
Standing volume	MMBF	405.6	0.8	406.4
Corridors		•	_	_
Existing/potential	Number	0	0	0
Mineral potential	_	0	_	
Very high	Acres	1,418	0	1,418
High	Acres	0	0	0
Moderate	Acres	40,855	0	40,855
Low	Acres	72,838	600	73,438
Mining claims	Number	Unknown	0	0
Oil & gas potential	_	•	•	•
Very high	Acres	0	0	0
High	Acres	0	0	0
Moderate	Acres	0	0	0
Low	Acres	115,151	600	115,751
Leases	Number	17	0	17
Leased area	Acres	14,706	0	14,706

#### 2. Selected Resource Values

#### a. Recreation

Use is primarily confined to the trail corridors by either day users or people crossing through to the adjacent wilderness. Current use is 10,000 recreation visitor days annually. Trailbike and snowmobile use is not expected to expand due to the rugged terrain. Many outstanding viewpoints of the Bitterroot Valley and canyons would be potentially accessible by road if the valley faces were assigned to developed management.

#### b. Wildlife

Wildlife includes populations of elk, mule deer, Rocky Mountain goat, bighorn sheep, moose, black bear, mountain lion, wolverine, fisher; pileated woodpeckers, golden eagles, hawks, ravens; blue, ruffed, and Franklin grouse; peregrine falcon habitat (unoccupied); cutthroat, rainbow, eastern brook, and dolly varden trout; and a host of smaller animals and birds.

The native bighorn sheep herd in Sheephead and Watchtower Creeks at the southern end of the roadless area is genetically pure, a rarity in both Montana and the U.S. The same herd inhabits part of the Blue Joint roadless area. The herd has a unique, learned migration pattern between winter and summer range that would probably be lost if interrupted. The other wildlife resources are typical of mountainous, forested terrain.

There are no known threatened or endangered species; however, the area is on the fringes of the Selway-Bitterroot ecosystem which has been identified by the U.S. Fish and Wildlife Service as a possible grizzly bear and gray wolf recovery area.

### c. Water

The use of most streams for irrigation is important to the Bitterroot Valley. High Lake dam and reservoir is within this roadless area. Access for maintenance has been by helicopter. This dam is under permit to a local water user association for supplementing late season irrigation.

Ditches, diversions, and headgates are on roaded lands below the area, except for the Little Rock Creek headgate and ditch. Blodgett Canyon contains a potential irrigation dam and reservoir site of 5,000-acre feet about 5 miles above the canyon mouth. Interest in pursuing this project has peaked and waned for at least 20 years and was the major factor in not including this portion of the drainage as a part of the existing wilderness when it was classified in 1963.

## d. Livestock

About 1,200 acres of suitable livestock range lie adjacent to the eastern boundary between Lost Horse and Tin Cup Creeks. Current use is primarily drift of cattle from better sites at lower elevations outside the roadless area.

Other suitable lands are widely scattered, generally confined to major stream bottoms, and currently reserved for recreation stock.

### e. Ecology

Ecology is extremely rich and diverse due to varied topography, aspect, elevation, snowslide patterns and fire history. However these ecosystems and communities are represented in existing wilderness.

#### f. Timber

Potential for timber production is primarily confined to mountain faces over-looking the Bitterroot Valley and to narrow riparian areas in most canyons. The mountain faces are in the timber base and contribute to the present sales program. They contain 18,000 acres of tentatively suitable timberland which is about 3 percent of Forest total.

Bass; Kootenai; Bear; Fred Burr; Mill; Blodgett; Sawtooth; Camas; North, South, and main Forks of Lost Horse; Tin Cup; Chaffin; Trapper; Boulder; Nelson; Soda Springs; Watchtower; and Sheephead Canyons are not currently in the suitable base and do not contribute to present sales programs. The 71,000 acres in this category contain about 16,000 acres of potentially suitable timberland or less than 3 percent of the tentatively suitable base.

# g. Minerals and Energy Resources

Information on geology and mineral deposits is adequate for preliminary mineral resource evaluation (Toth et al., 1983). Known mining claims are confined to a small group of claims in Trapper Creek. Approximately 13,600 acres from Trapper Creek north (outside of RARE II wilderness recommendations) are covered by 17 oil and gas leases. The area generally has a low potential for both mineral and energy resources.

#### h. Cultural

Prehistoric sites are confined to a fork of the Southern Nez Perce Indian Trail; however, the current inventory is minimal. Location of other sites can be expected particularly along the major stream courses.

#### 1. Land Use Authorizations

The operation of High Lake dam and reservoir in Blodgett Canyon and several guide and outfitter permits are authorized within the area. Many other guides and outfitters pass through the area enroute to the Selway-Bitterroot Wilderness.

## j. Non-Federal Lands

Two parcels of state and private lands lie near the eastern boundary in Roaring Lion and Bass Creeks.

### k. Other Considerations

## (1) Fire

Fire occurrence is low and the potential for large fires is moderate due to heavy accumulations of down fuel, particularly in lodgepole pine stands.

### (2) Insects and Disease

Insects and disease are generally endemic; however, dwarf mistletoe reduces growth in some areas as does spruce budworm, a recurrent pest. There are also areas of high-risk lodgepole pine that will become increasingly susceptible to mountain pine beetle attack.

#### D. Need

# 1. Proximity to Existing Wilderness and Population Centers

See Tables C-1 and C-2.

### 2. Contribution to the Wilderness Preservation System

Classification of at least some canyon mouths would provide wilderness for entire drainages. Currently, none of the canyons in the eastern third of the Selway-Bitterroot Wilderness are wilderness in their entirety but are considered by most to be an integral part of the wilderness. This would also contribute towards a describable and locatable boundary on topographic breaks rather than the current section lines. This would facilitate management both within and outside of wilderness. The genetically pure bighorn sheep herd in Sheephead and Watchtower Creeks would be a unique addition.

#### 3. Public Interest

There is significant local, regional, and national demand to add all canyon mouths to the wilderness system. This would also satisfy expectations of many current users. Conversely, there is significant local demand to leave at least some canyons unclassified, with fewer potential restrictions on recreation use, but still undeveloped.

Criteria for RARE II wilderness recommendations were to: recommend wilderness for about one-half of canyon mouths; select canyons providing major access to wilderness, and/or those best protected from outside influences; and to identify good topographic boundaries to correct existing deficiencies. Wilderness was recommended for 48,000 acres including Bass, Kootenai, Bear, Mill, Blodgett, Sawtooth, North and South Forks of Lost Horse, Tin Cup, Chaffin, Trapper, Boulder, Nelson, Soda Springs, Sheephead, and Watchtower canyons. The 1984 Montana governor's recommendation for wilderness includes these lands as did the Montana state bill (S. 2850) of 1984.

In RARE II, 84 percent of the responses to the RARE II DEIS favored wilderness for at least a portion of the area. Interest in the mountain faces overlooking the Bitterroot Valley is about evenly split between wilderness and nonwilderness. A substantial number of those favoring nonwilderness also favor nondevelopment or very limited development, in recognition of the visual significance of this area.

In the 1983 public involvement on roadless areas, most of the public support was for wilderness classification. Especially valued for wilderness are the canyon mouths; Sheephead and Watchtower drainages; and Trapper Creek, Baker Creek, and Nelson Creek drainages. The reasons mentioned for wilderness include recreation, hiking, beauty, mountain goat range, contiguous to existing wilderness, and indigenous bighorn sheep in Sheephead - Watchtower Area. Those opposed to roadless or wilderness mentioned that the area is a favorite for snowmobiling and motorcycling, and has a high potential for timber; and reductions in the timber base would be detrimental to the valley economy.

The following comments portray how the area is perceived (Planning Record: Roadless Area Evaluation Public Response Summary, 1983):

"Many of the newcomers to the Bitterroot Valley have elected to acquire property and become taxpaying residents because of the magnificence of the forested mountains . . . The reason for my leaving the beautiful seaside city of LaJolla, California."

"The mouths of these canyons are really where the Selway-Bitterroot experience begins for anyone going up these wild scenic areas."

"This is next to heaven . . . . "

"Visitors' to the area first remarks concern the striking beauty of the canyon mouths as you drive through the valley."

"Who has not failed to notice the sun glinting off the south face of Blodgett Canyon and marveled?"

"Meadow Creek (Sheephead-Watchtower), Trapper Creek, and Nelson Lake border are the heart of the alpine country in the Bitterroot Range."

For those who support nonwilderness uses of the area the reasons include:

"Have all the wilderness our economy can tolerate."

"The majority of people can't enjoy wilderness."

"Area has high potential values."

The majority of comments on the Forest Plan DEIS opposed any semiprimitive or wilderness designations. The primary reasons are: to assure an adequate supply of logs to mills as a vital part to the Bitterroot's economy; there is more than adequate existing wilderness; and Blodgett Canyon may be needed as a municipal water supply for Hamilton. Most of these respondents did not mention specific roadless areas, but those opposed to development did. Comments specific to the roadless area favored nondevelopment designations, including wilderness, for all or a portion of the area. The primary reasons are: to round out the existing wilderness by adding the lower portion of travel corridors; to eliminate the potential for small hydro development; it is not in the public interest to lose money on a timber road access program and put other resources at risk; and roadless areas are becoming an increasingly scarce resource. There was also considerable support for a scenic area designation for mountain faces to the east of Ward and Downing Mountains and Mill Point.

## E. Alternatives and Environmental Consequences

#### 1. Management Emphasis by Alternative

Management prescriptions providing for roads have been grouped into a roaded management emphasis, since roading will preclude wilderness classification. Likewise, management prescriptions that do not provide for roads but will be managed for low levels of timber outputs are identified as unroaded. In this emphasis, timber sale activity will preclude wilderness in the short term, but not necessarily in the long term. The semiprimitive recreation emphasis will maintain the area's roadless/undeveloped character.

Table C-16 displays total acreage assignment by management emphasis and development by decade for each alternative. Table C-17 shows suitable timberland and mineral potential acreage by management emphasis and alternative.

Section E2 uses Bitterroot Forest alternative names but describes the entire roadless area. Impacts are not separated by Forest since the Nez Perce acreage is small.

Table C-16
Management Emphasis (Selway-Bitterroot)
(thousand acres)

Management	-								A	1 te	rnati	ve-							
Emphasis Bitterroo	-		В		С		E		E	1	1	€2	F		G		H		J
Nez Perce																			
Nonwilderness designation	115	7	66	9	38	6	67	5	67	5	66	9	67	\$	36	7	24	4	
Roaded Emphasis	53	5	36	5	29	6	17	5	17	5	18	7	16	9	11	8	10	5	
Bitterroot Forest	52	8	36	5	29	6	17	5	17	5	18	7	16	9	11	8	10	5	
Nez Perce Forest		6		0		0		0		0		0		0		0		0	(
Unroaded Emphasis		0		0		0	9	8	9	8		Q	13	5	14	4		0	(
Bitterroot Forest		0		0		0	9	8	9	8		0	13	5	14	4		0	
Nez Perce Forest		0		0		٥		0		Ø		Đ		0		0		0	
Semiprimitive recreation Emphasi	s 62	3	30	4	9	٥	40	2	40	2	48	2	37	ţ	10	5	13	9	C
Bitterroot Forest	62	3	30	4	9	0	39	6	39	6	48	2	36	5	10	5	13	9	(
Nez Perce Forest		0		0		0		6		6		0		6		0		0	
Wilderness designation		0	48	9	77	1	48	3	48	3	48	9	48	3	79	Ø	91	4	115 1
Bitterroot Forest		0	48	3	76	5	48	3	48	3	48	3	48	3	78	4	90	8	115
Nez Perce Forest		0		6		6		0		0		6		0		6		6	6
Area developed by																			
Decade 1	12	0	12	3	2	4	11	1	13	3	3	0	12	4	6	5	2	9	c
Bitterroot Forest	12	0	12	3	2	4	11	1	13	3	3	0	12	4	6	5	2	9	(
Nez Perce Forest		0		0		0		0		0		0		0		0		0	(
Decade 5**	52	9	36	4	29	6	27	2	27	2	18	7	30	3	26	1	10	5	C
Bitterroot Forest	`. 52	8	36	4	29	6	27	2	27	2	18	7	30	3	26	1	10	5	C
Nez Perce Forest		1		0		0		0		0		0		0		0		0	C
Area roadless in *																			
Decade 1	103	7	54	5	36	2	56	3	56	3	63	8	55	0	30	2	21	5	(
Bitterroot Forest	103	1	54	5	36	2	55	7	55	7	63	8	54	4	30	2	21	5	(
Nez Perce Forest		6		0		0		6		6		0		6		0		0	C
Decade 5**	62	8	30	4	9	0	40	2	40	2	48	2	37	1	10	5	13	9	C
Bitterroot Forest	62	3	30	4	9	0	39	6	39	6	48	2	36	5	10	5	13	9	(
Nez Perce Forest		5		0		0		6		6		0		6		0		0	c
Current roadless acres	115	7	115	7	115	7	115	7	115	7	115	7	115	7	115	7	115	7	115 7
Bitterroot Forest	115		115		115		115		115	•	115	-	115	•	115		115	•	115 3
Nez Perce Forest		6		6	_	6		6	- 3	6	-	6	-	6		6	,	6	11) 6

<sup>\*</sup> Does not include wilderness designation

<sup>\*\*</sup> Values shown for Decade 1 are planned outputs and effects. Values shown beyond Decade 1 are projections of the outputs and effects expected if the alternatives were selected to continue beyond the first decade

Table C-17
Suitable Timberland and Mineral Potential (Selway-Bitterroot) (thousand acres)

Management						Alte	rnative				
Emphas1s	Bitterroot Nez Perce *	A	В	С	Е	E1	E2	F	G	н	J
Tentatively suitable lan	ď										
Roaded emphasis		41 0	28 3	21 0	14 7	14 7	15 2	12 0	83	8 1	
Bitterroot Forest		40 9	28 3	21 0	14 7	14 7	15 2	12 0	83	8 1	(
Nez Perce Forest		1	0	0	0	0	0	0	0	0	•
Unroaded emphasis		0	0	0	46	4 6	0	93	11 3	0	(
Bitterroot Forest		0	0	0	4 6	46	0	96	11 3	0	(
Nez Perce Forest		0	0	0	0	0	0	0	0	0	(
Semiprimitive recreation	on emphasis	0	0	1 3	9 1	9 1	13 1	7 0	48	8 6	(
Bitterroot Forest		0	0	1 3	90	9 0	13 1	7 0	4 8	8 6	
Nez Perce Forest		0	0	0	1	1	0	1	0	0	
Wilderness emphasis		0	12 7	18 7	12 6	12 6	12 7	12 6	16 6	24 3	40
Bitterroot Forest		o	12 6	18 6	12 6	12 6	12 6	12 6	16 5	24 2	40 8
Nez Perce Forest		0	1	1	0	0	1	0	1	1	:
igh mineral potential											
Roaded emphasis		15	1 2	1 1	1	1	1	5	4	1	(
Bitterroot Forest		15	1 2	1 1	1	1	1	5	4	1	o
Nez Perce Forest		0	0	0	0	0	0	0	0	0	c
Unroaded emphasis		O	0	0	0	0	0	3	3	0	ď
Bitterroot Forest		0	a	0	0	0	0	3	3	0	a
Nez Perce Forest		0	0	0		0	0	0	0	0	c
Semiprimitive recreation	on emphasis	0	1	1	1 1	1 1	1 1	4	3	5	c
Bitterroot Forest		0	1	1	1 1	1 1	1 1	4	3	5	c
Nez Perce Forest		0	0	0	o	0	٥	0	o	0	c
Wilderness emphasis		0	2	3	3	3	3	3	5	9	1 5
Bitterroot Forest		0	2	3	3	3	3	3	5	9	1 5
Nez Perce Forest		0	O	0	0	0	0	0	0	á	0

<sup>\*</sup> Not evaluated in Nez Perce Forest's EIS

### 2. Impacts

a. Designation: Wilderness

Management Emphasis: Wilderness

The entire roadless area is designated for wilderness in Alternative J. Alternative A designates none of the acres to wilderness; while all other alternatives designate from 44 to 83 percent.

Wilderness expands the acreage of the adjacent Selway-Bitterroot Wilderness. All alternatives except A would preserve the land having the highest wilderness attributes. Alternatives C, G, H, and J would also preserve lands with moderate attributes.

Timber production is precluded on all tentatively suitable timberland in Alternative J, about 31 percent in B, E, E2, and F, and 40, 46 and 59 percent in G, C, and H respectively. All tentatively suitable timberland is 6 percent of the Forest total.

Wilderness classification precludes semiprimitive recreation emphasis in Alternative J and reduces the acreage available in all other alternatives except A. Recreation use will continue to be dominated by hunting, fishing, and camping. Mechanized use such as trailbike, snowmobile, and chain saw use would be prohibited.

Minerals exploration and development is foreclosed subject to valid existing rights. All land having a high/very high mineral potential is withdrawn from mineral entry in Alternative J, 60 percent in H, and from 13 to 33 percent in B, C, E, E1, E2, F, and G.

Current livestock use would continue.

The nonpriced benefits are as follows:

- A natural level of visual quality is maintained.
- The wilderness system area is increased.
- A natural level of big-game forage and security cover is maintained. Big-game cover/forage ratios would be determined by natural events such as fire.
- Vegetative diversity tends towards old growth but is modified by a more nearly natural role for wildfire.
- Old-growth dependent wildlife species are favored.
- Natural levels of watershed and fisheries are maintained.
- Local wood products employment decreases in Alternatives H and J, but should remain stable in other alternatives.

Economic and social effects vary depending on the amount of tentatively suitable timberland and areas of high mineral potential recommended for wilderness. This effect is greatest for Alternative J and least in Alternative B.

The wood products and mining industries would not be supported by this emphasis. Alternative J could result in loss of wood products jobs in Ravalli County. Wilderness designation could cause an increase in wilderness use and quality of experience. Publics interested in wilderness and primitive recreation would be supported.

# b. Designation: Nonwilderness Management Emphasis: Roaded

The management prescriptions included in this emphasis are timber, range, winter range, partial retention, roaded retention and riparian.

Some land is included in this emphasis in all alternatives except J. The highest level is in Alternative A where 46 percent of the roadless area is in this emphasis, and the lowest is 10 percent in Alternative H.

All tentatively suitable timberland is available for management in Alternative A; 69, 51, 36, 37, and 29 percent is available in B, C, E (and E1), E2, and F respectively; and 20 percent in G and H. High-value old growth is scheduled for early removal; however, due to long rotations, old growth will be retained above minimum levels in partial retention, retention, and riparian prescriptions. Early harvest after the first decade is also scheduled in lodgepole pine stands which blanket much of the area.

Roads and timber harvest will foreclose future consideration for wilderness by the end of the first decade on about 11 percent of the roadless area in Alternatives A, B, E, and F with lesser amounts in remaining alternatives. Roads reduce the naturalness and opportunities for solitude in the area. Present semiprimitive recreation use would be disrupted in some locations as the recreation setting would shift to roaded.

Access for mineral and energy exploration is enhanced as the road system expands. Most land of high and very high mineral potential is readily accessible in Alternatives A and B.

Transitory forage for livestock and wildlife is created by timber harvest.

Nonpriced benefits and costs include:

- Visual quality will be at the lowest level (maximum modification) in Alternative A; moderate levels in C, E, E2, F and H; and high in Alternative G.
- Characteristics for future consideration of wilderness and semiprimitive recreation are foregone.
- Security cover for elk will be greatly reduced in Alternatives A, B, and C, but cover/forage ratios would be improved.
- Vegetative diversity tends toward younger age classes in Alternatives A, B, and C but retains a sizeable old-growth component in others.
- Local wood products employment increases significantly in Alternatives A, B, and C; remains at current levels in E, E1, E2, and F; and declines in G and H.

Economic effects vary depending upon the amount of land that is suitable for timber production and the management of visual, wildlife, and watershed resources. The greatest positive effect on the economy is for Alternatives A and B where practically all of the tentatively suitable land is retained in the timber base, which is about 6 percent of the Forest total. The wood products and mining industries would be supported. Publics favoring the roadless or wilderness characteristics would not be supported although the area would remain much like it is for another 10 years. Those publics using the area for primitive and semiprimitive recreation would have to adjust to a roaded setting or shift their use elsewhere. Outfitter permits would continue although the hunting experience would be altered.

# c. Designation: Nonwilderness Management Emphasis: Semiprimitive Recreation

The semiprimitive recreation prescription is included in this emphasis.

Some land is included in this emphasis in all alternatives except J. The highest acreage is in Alternatives A, B, E, E1, E2, and F, where 26 to 54 percent of the roadless area is in this emphasis. The emphasis in Alternatives A and B are confined to relatively large blocks of land that are not suitable for timber production.

Except for possible mineral entry, roadless characteristics within a core area in Alternatives B, C, E, E1, E2, and F will remain available for future wilderness consideration. The roadless character, naturalness, and opportunities for solitude and semiprimitive recreation would be maintained. Recreation use will continue to be dominated by hunting, fishing, and camping. Trailbike, snowmobile, and chain saw use is compatible with this emphasis.

Current levels of livestock use would continue.

Big-game cover/forage relationships will basically be determined by natural events such as wildfire but can be modified by prescribed fire.

Roads are not needed for surface management purposes but will be permitted for mineral activities where construction is justified on the basis of mineral showings or data, and where it is the next logical step in development of the mineral resource. Zero to 1,100 acres of those lands rated as very high or high mineral potential are included in this emphasis. Alternatives E, E1, and E2 contain the highest amount; A, B, and C contain the least.

Timber production is precluded on up to 22 percent of the tentatively suitable timberland in Alternatives E and E1, and 32 percent in E2. No tentatively suitable timberland is in this emphasis in Alternatives A and B. Alternative C has a few isolated high quality timber sites in this emphasis. Alternatives G and H incorporate timberland with moderate site quality and difficult terrain, which would be difficult to develop because of low product values.

Nonpriced benefits and costs include:

- A natural level of visual quality is maintained.
- Wilderness option is retained for future consideration.
- Near natural cover/forage ratios for big game are retained but may be modified by prescribed fire.
- Vegetative diversity tends towards old growth, but may be modified by prescribed fire.
- Old-growth dependent wildlife are favored.
- Natural levels of watershed and fisheries are retained.
- The current level and mix of recreation use is retained.
- Local wood products employment levels decrease in Alternatives E, E2, and H; should be retained in G; and increased in A, B, and C.

Economic and social effects vary depending upon the amount of tentatively suitable timberland in this emphasis. The effect is greatest in Alternatives E, E1, E2, F, and H with no effect in A and B. Where tentatively suitable timberland is included in this emphasis, the wood products industry would not be supported. Mining and mineral explorations could continue but costs would be higher without road access and where constraints are applied to maintain the semiprimitive recreation objectives. The land in this emphasis would remain much like it currently exists, and current recreation and livestock uses would be supported.

# d. Designation: Nonwilderness Management Emphasis: Unroaded

The unroaded retention prescription is included in this emphasis.

This emphasis is in Alternatives E (and E1), F, and G with 8, 11, and 12 percent of the roadless acreage respectively.

Timber harvest forecloses future consideration for wilderness by the end of the fifth decade; however, about 50 percent of the emphasis remains available at the end of decade 1. The current mix of recreation use will be maintained. Semiprimitive recreation potential would remain.

From 11 to 28 percent of the tentatively suitable timberland is included in the emphasis in Alternatives E, F, and G. High-value old growth is scheduled for early removal; however, due to long rotations significant old growth will be maintained. Economic efficiency of timber management of this emphasis is poor since timber harvest is limited to expensive aerial systems. Removal of large, old-growth ponderosa pine is efficient but other species may not be.

Mineral exploration and development is an appropriate use but would be difficult due to the lack of road access. Twenty percent of the land rated as very high and high mineral potential are assigned to this emphasis in Alternatives F and G and none in E.

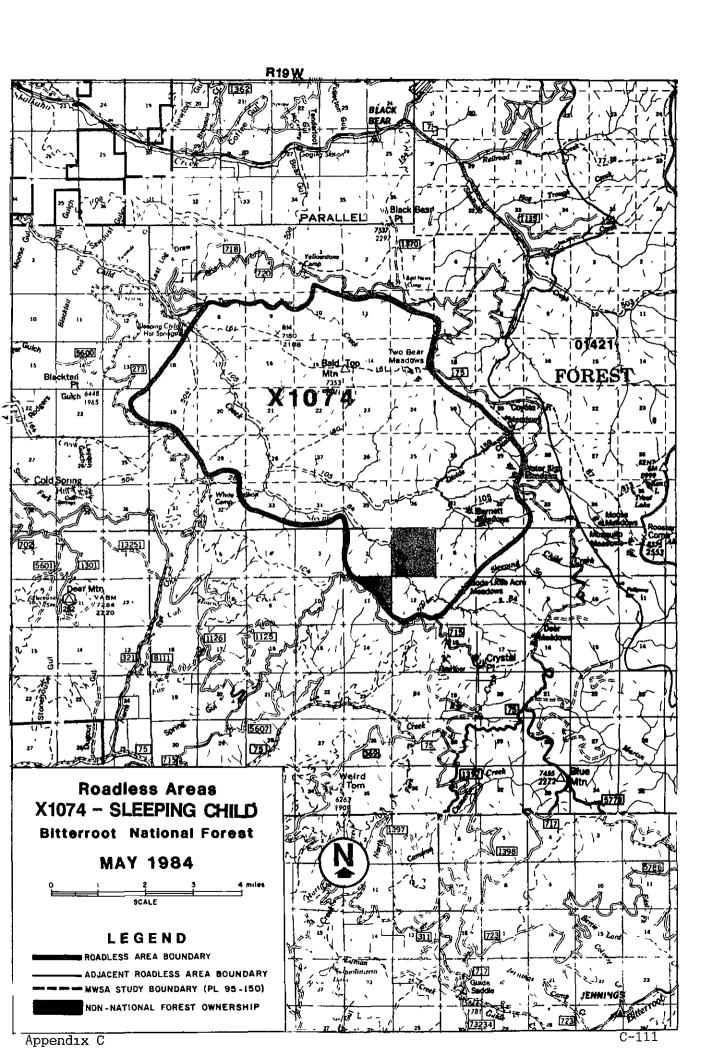
Transitory forage for livestock is created by timber harvest.

Nonpriced benefits and costs include:

- A high level visual quality will be retained.
- Future consideration for semiprimitive recreation will be retained.
- Vegetation diversity tends towards a balance in age classes including old growth.
- Water quality and fisheries remain at high levels.
- Unroaded big-game security areas are retained.
- The present mix of recreation opportunities is maintained.

From a social and economic standpoint, suitable timberland is available thus supporting the wood products industry. Mining and exploration are compatible with the emphasis although road access would not be provided by Forest activities. Although the naturalness of the area would be impacted, the roadless character would not be foregone thus supporting current semiprimitive recreation uses.





### VIII. SLEEPING CHILD ROADLESS AREA

This area is identified by number X1074. It was in a completed unit plan and consequently did not go through the RARE II process. Roadless area acreage is:

National Forest	Gross Acres	Net Acres
Bitterroot	22,243	21,423

### A. Description

The area is located in the central portion of Ravalli County, Montana about 15 miles southeast of Hamilton, the county seat. It encompasses the middle portion of Sleeping Child Creek including two major tributaries—Two Bear and Divide Creeks. Headwaters and the remaining lands outside the boundary have been roaded and developed for timber production. Access to the area is from State Highway 38, the Sleeping Child Road, and Forest roads along the boundary. A network of four trails provides access within the area.

The area is about 8 miles long and 4 miles wide. Breaklands adjacent to major streams are steep; however, most of the eastern half is characterized by a rather gently rolling landscape. Elevations range from 4,800 to 7,400 feet with about 4 percent of the area over 7,000 feet. About 50 percent of the boundary is well-defined, following ridgetops or streams. The remainder is midslope lying above or below existing development.

Most of the area is forested and interspersed by occasional rock outcrops and wet meadows. Barnett, Coyote, and Two Bear are the better known meadows. Principal tree species are lodgepole pine and Douglas-fir. Ground cover is primarily beargrass.

#### B. Analysis of Wilderness Suitability

#### 1. Wilderness Attributes

#### a. Natural Integrity and Appearance

Approximately 7 percent of the area in the southeast corner was burned in the 1961 Sleeping Child Fire. Dozer-constructed firelines and primitive logging roads are still visible. Other impacts are a cabin at Coyote Meadows, remnants of hunting camps and evidence of cattle grazing. The remaining area has a natural appearance.

## b. Opportunities for Solitude

Topographic and vegetative screening provides opportunities for solitude in the central portion. However, civilization appears close at hand in much of the area due to its relatively small size and proximity to roads and development just outside the boundary.

### c. Primitive Recreation Opportunities

These include hunting, hiking, fishing, and horseback riding. Opportunities for primitive recreation are limited due to the lack of attractions. Day-use opportunities are provided. Challenging experiences would be rare.

#### d. Other Features

Special features include the meadows.

## 2. Manageability and Boundaries

The following adjustments in net acres have taken place since the unit plan inventory:

<u>Adjustment</u>	Acres
Unit plan inventory Developed or under contract Refined acreage calculation Current inventory	23,600 -2,400 +223 21,423

Approximately half the existing boundary would be difficult to describe and locate on the ground since it is midslope lying above or below existing roads and development. Adjusting boundaries to logical topographic breaks would remove about 12,000 acres from consideration as wilderness; however, doing so would measurably improve opportunities for solitude and would remove most private lands and some impacts from wilderness consideration.

A core area of about 9,000 acres has been identified. It is enclosed on all but the east side by ridgetops which screen out much off-area evidence of civilization. It encompasses all of Divide Creek below existing development in the drainage headwaters. This boundary adjustment enhances naturalness and solitude and retains the meadows.

# C. Availability for Wilderness

# 1. Resource Potential and Use

Table C-18 Sleeping Child Roadless Area Resource Potential and Use

Category	Unit	Bitterroot Forest
Gross area	Acres	22,243
Net area	Acres	21,423
Recreation		. •
Primitive	RVD's	0
Semiprim. nonmotor.	RVD's	0
Semiprim. motor.	RVD's	600
Roaded natural	RVD's	200
Wıldlife habıtat		
Elk & deer		
Summer range	Acres	21,423
Winter range	Acres	Ō
Rocky mountain goat	Acres	0
Bighorn sheep	Acres	0
Fisheries streams	Miles	22
Lakes	Number	0
Fisheries lakes	Acres	0
Water developments	Number	0
Livestock range		
Current use	AUM's	139
Suitable rangeland	Acres	525
Current allotments	Number	1
Other suitable	Acres	0
Timber		_
Tentatively suitable	Acres	20,333
Standing volume	MMBF	185.0
Corridors		
Existing/potential	Number	0
Mineral potential		J
Very high	Acres	0
High	Acres	Ô
Moderate	Acres	11,806
Low	Acres	9,617
Mining claims	Number	1
Oil & gas potential		-
Very high	Acres	0
High	Acres	Ö
Moderate	Acres	5,473
Low	Acres	15,950
Leases	Number	11
Leased area	Acres	21,423

#### 2. Selected Resource Values

#### a. Recreation

Current use is very light consisting primarily of big-game hunting, but includes limited day-use activities such as fishing, hiking, horseback riding, and viewing wildlife.

#### b. Wildlife

Elk, moose, black bear, mule deer, grouse, and numerous nongame animals and birds are common to the area. The area is important for elk security during the hunting season. Major streams sustain catchable populations of cutthroat, rainbow, and brook trout.

#### c. Water

Water from the area is used extensively for downstream irrigation. Drainage headwaters have been developed by roads and timber harvest. There has been some modification from natural conditions; however, water quality remains high.

#### d. Livestock

The area contains parts of one grazing allotment for 139 animal unit months. Much of this use occurs in the 1961 burn which is rapidly returning to tree cover. Future grazing potential will become increasingly restricted as successional stages return the area to forested cover.

# e. Ecology

Varied topography, aspect, and elevations provide a moderate diversity of ecosystems that are well-represented in existing wilderness.

#### f. Timber

About 95 percent of the area is tentatively suitable for timber production. Standing timber volume is estimated at 185 MMBF, much of which is lodgepole. Site productivity is generally low in the eastern portion and moderate to high elsewhere.

#### g. Minerals and Energy Resources

Hardrock mineral potential is rated moderate to low. There is one known mining claim. Traditional theory places the oil and gas potential as low to moderate. Oil and gas leases cover about 11,500 acres.

#### h. Cultural

There are no known cultural resources; however, much of the area has not been surveyed.

# i. Land Use Authorizations

These are confined to the grazing allotments.

#### Non-Federal Lands

Plum Creek Timber Company owns about 800 acres in the southeast corner.

#### k. Other Considerations

#### (1) Fire

Fire occurrence is low and the potential for large fires is moderate due to heavy down fuels under much of the lodgepole pine.

### (2) Insects and Disease

Insects and disease are generally endemic; however, dwarf mistletoe reduces growth in some areas as does spruce budworm, a recurrent pest. There are also areas of high-risk lodgepole pine that will become increasingly susceptible to mountain pine beetle attack.

#### D. Need

#### 1. Proximity to Existing Wilderness and Population Centers

See Table C-1 and C-2.

# 2. Contribution to the Wilderness Preservation System

The area would add a relatively small acreage as a new wilderness. Wilderness attributes are rated moderate to low. Ecosystems and wildlife are well-represented in existing wilderness.

#### 3. Public Interest

There was little support for wilderness in the 1983 public involvement on roadless areas; however, the area's undisturbed watershed is highly valued by downstream landowners and irrigation users. There is also strong support for roadless management because the area "... provides excellent escape cover for elk in an area that is completely surrounded by roads" and "there are recreation opportunities that have been used for years and years by many people and its use increases continuously." Supporters of development cite "high potential timber values" and "wilderness has adverse effects on big-game management, insect and disease control, and fuels management" (Planning Record: Roadless Area Evaluation Public Response Summary, 1983).

Montana's governor did not recommend the area for wilderness (Schwinden, 1984) nor did the Montana state bill (S. 2850) of 1984.

The majority of comments on the Forest Plan DEIS opposed any semiprimitive or wilderness designations. The primary reasons are to assure an adequate supply of logs to mills as a vital part to the Bitterroot's economy, and there is more than adequate existing wilderness. Most of these respondents did not mention specific roadless areas, whereas those opposed to development did. Comments specific to the roadless area favored nondevelopment designations for all or a portion of the area; in this case, semiprimitive recreation. The primary reasons are: to enhance wildlife values in an area that is surrounded by development; it is not in the public interest to lose money on a timber road access program and put other resources at risk; and roadless areas are becoming an increasingly scarce resource.

## E. Alternatives and Environmental Consequences

# 1. Management Emphasis by Alternative

Management prescriptions providing for roads have been grouped into one management emphasis, roaded, since roading will preclude wilderness. Management prescriptions that provide for timber harvest but not roads are identified under an unroaded management emphasis. In this emphasis, timber sale activity would preclude wilderness in the short term but not necessarily in the long term, and the area would remain roadless but not undeveloped. The semiprimitive recreation emphasis will maintain both the roadless and undeveloped character. Table C-19 displays total acreage assignment by management emphasis, and development by decade, for each alternative. Table C-20 shows suitable timberland and mineral potential acreage, by management emphasis and alternative.

Table C-19
Management Emphasis (Sleeping Child)
(thousand acres)

Management				_		_		_						_		_				,
Emphasis 	Bitterroot	A		В		C		E		8:	ı ——	E2		F		G		н		J
Vonwilderness des:	ignation	21	4	21	4	21	4	21	4	21	ů.	21	4	21	4	21	lţ.	21	4	
Roaded Emphasis		21	4	21	4	21	4	10	6	10	6	9	S	13	5	10	7	3	8	
Unroaded Emphas:	ıs		0		0		0		ō		Û		0	7	9		0		Ð	
Semiprimitive re	ecreation Emphasis		0		0		0	10	8	10	8	12	2		0	10	7	17	6	
Vilderness design	ation		0		0		0		0		0		0		0		0		0	21
rea developed by																				
Decade 1		10	7	10	7	5	1	7	9	7	9	2	1	6	7	8	0	1	9	
Decade 5**		21	4	21	4	21	4	10	6	10	6	9	2	21	4	10	7	3	8	
rez roadless in"																				
Decade 1		10	7	10	7	16	3	13	4	13	4	19	3	14	7	13	4	19	5	
Decade 5**			0		Ō		0	10	8	10	8	12	2		0	10	7	17	6	
Current roadless	acres	21	4	21	4	21	4	21	4	21	4	21	4	21	4	21	4	21	4	21

<sup>\*</sup> Does not include wilderness designations

<sup>\*\*</sup> Values shown for Decade 1 are planned outputs and effects. Values shown beyond Decade 1 are projections of the outputs and effects expected if the alternatives were selected to continue beyond the first decade

Table C-20 Suntable Timberland and Mineral Potential (Sleeping Child) (thousand acres)

Management		Alternative														
Emphasis	Bitterroot	A	В	С	E	E1	E2	F	G	н						
Tentatively suitable	e land															
Roaded emphasis		20 3	20 3	20 3	10 4	10 4	86	13 0	10 5	32						
Unroaded emphasis		0	0	0	0	0	0	73	0	0						
Semiprimitive rec	reation emphasis	0	0	0	99	99	11 7	0	98	17 1						
Walderness emphas:		0	0	0	o	0	o	0	0	0						
High mineral potent	ial *															

<sup>\*</sup> This area does not have high mineral potential

# 2. Impacts

a. Designation: Wilderness

Management Emphasis: Wilderness

Nearly the entire area is recommended for wilderness in Alternative J. This recommendation would expand the wilderness system by creating a new wilderness. Wilderness designation can enhance the area's wilderness attributes by eliminating evidence of human activities such as an existing cabin, remains of hunter camps, motorized use along existing trails, and firelines.

Timber production is precluded on all tentatively suitable timberland. This amounts to 3 percent of the Forest-wide total. It would also remove about 185 MMBF of predominantly lodgepole pine but also some old-growth Douglas-fir and ponderosa pine. Utilization of sound deadwood for houselogs would be foregone.

Current livestock grazing of 139 AUM's could continue, but could be dropped if the existing permit is vacated.

Recreation use would continue to be dominated by hunting. Mechanized use such as trailbike, snowmobile, and chain saw use would be prohibited.

Mineral exploration and development is foreclosed on all lands subject to valid existing rights. No lands were rated as having high or very high mineral or energy potential.

Nonpriced benefits and costs are:

- A natural level of visual quality is maintained.
- The wilderness system is increased.
- A natural level of big-game forage and security cover is maintained. Big-game cover/forage ratios would be determined by natural events such as fire.
- Vegetative diversity tends towards old growth but is modified by a more nearly natural role for wildfire.
- Old-growth dependent wildlife species are favored.
- Natural levels of watershed and fisheries are maintained.
- Local wood products employment is decreased.

Economic and social effects are due to the unavailability of 20,100 acres of tentatively suitable timberland which may affect local wood products jobs.

Wilderness designation could cause a slight increase in wilderness use. Publics interested in wilderness for the area and those using the area for primitive recreation would be supported.

# b. Designation: NonwildernessManagement Emphasis: Roaded

The timber, range, partial retention, and riparian management prescriptions are in this management emphasis. Some land is included in this emphasis in all alternatives except J. The highest level is in Alternatives A. B., and C where 100 percent of the roadless area is in this emphasis; the lowest in Alternative H at 18 percent.

All tentatively suitable timberland is included in Alternatives A, B, and C; 51 to 64 percent in E, F, and G; 42 percent in E2; and about 16 percent in Alternative H. High value old growth is scheduled for early removal; however, due to long rotations, old growth will be retained above minimum levels in partial retention and riparian prescriptions. After the first decade, harvest is also scheduled in lodgepole pine stands which cover much of the area.

Roads and timber harvest will foreclose future consideration for wilderness by the end of the fifth decade; however, about 50 percent would remain roadless at the end of decade 1 in Alternatives A and B; 63 percent in E and G; 69 percent in F; 76 percent in C; and 95 percent in E2. Roads would reduce the naturalness of the area and decrease opportunities for solitude. Present semiprimitive recreation use would be disrupted as the recreation setting shifts to roaded natural.

Access for mineral and energy exploration is enhanced as the road system expands. Land is readily accessible in Alternatives A, B, and C.

Transitory forage for livestock and wildlife is created by timber harvest. Current livestock grazing of about 139 AUM's would continue.

Nonpriced benefits and costs include:

- Visual quality will be at the lowest level (maximum modification) in Alternatives A, B, C, E, E1, E2, F and H, and at a moderate level in Alternative G.
- Characteristics for future consideration of wilderness or semiprimitive recreation are foregone by the end of the fifth decade.
- Security cover for elk will be greatly reduced, but mitigated by road closures.
- Vegetative diversity tends towards younger timber age classes.
- Local wood products employment increases in Alternatives A, B, and C; remains at current levels in E, F, and G; and declines in E2 and H.
- Water quality and fisheries would be adversely affected but mitigated by high road construction and maintenance standards.

Economic effects vary depending upon the amount of land that is suitable for timber production and the degree of constraints imposed to recognize visual, wildlife, and watershed values. The greatest positive effect on the economy is in Alternatives A, B, and C where practically all of the tentatively suitable timberlands is managed. This amounts to less than 4 percent of the Forest total. Although significant portions of the area would remain much like they are for another 10 years, those publics using the area for primitive and semi-primitive recreation would have to adjust to a roaded natural setting or shift their use elsewhere. Outfitter permits could continue, although the hunting experience would be altered.

# b. Designation: NonwildernessManagement Emphasis: Semiprimitive Recreation

The semiprimitive recreation prescription is included in this emphasis.

Some land is included in this emphasis in Alternatives E, E1, E2, G, and H. About 82 percent of the roadless area is in this emphasis in Alternative H, about 57 percent in E2, and about 50 percent in E and G.

Except for possible mineral entry, roadless characteristics are retained within a core area in Alternatives E, E2, G, and H; and the land will remain available for future wilderness consideration. The roadless character of the land would be maintained as would the wilderness attributes of naturalness, opportunities for solitude and semiprimitive recreation. Recreation use will continue to be dominated by hunting. Trailbike, snowmobile, and chain saw use is compatible.

Current levels of livestock use would continue.

Big-game cover/forage ratios will basically be determined by natural events such as wildfire but can be modified by prescribed fire.

Roads are not needed for surface management purposes but will be permitted for mineral activities where construction is justified on the basis of mineral showings or data, and where it is the next logical step in development of the mineral resource.

Timber production is precluded on 49 percent of the tentatively suitable timberland in Alternatives E and G, 58 percent in E2, and 84 percent in H. Alternatives E, E1, E2, and G incorporate land with moderate site quality, much of what would be difficult to develop because of low product values.

Nonpriced benefits and costs include:

- A natural level of visual quality is maintained.
- Wilderness option is retained for future consideration.
- Near natural cover/forage ratios for big game are retained but may be modified by prescribed fire.
- Vegetative diversity tends towards old growth, but may be modified by prescribed fire.
- Old-growth dependent wildlife are favored.
- Natural levels of watershed and fisheries are retained.
- The current mix of recreation use is retained.
- Local wood products employment is decreased.

Economic and social effects vary depending upon the amount of tentatively suitable timberland in this emphasis. The effect is greatest in Alternatives E, E1, E2, G, and H with no effect in A, B, and C. Miners could continue to operate; however, costs of would be higher without road access. Land would remain much like it currently is, thus supporting current recreation and livestock uses.

c. Designation: Nonwilderness
Management Emphasis: Unroaded

The unroaded retention prescription is included in this emphasis.

About 37 percent of the area has this emphasis in Alternative F. Timber harvest forecloses future consideration for wilderness by the end of the fifth decade; however, wilderness attributes would eventually return if timber harvest ceased. Also, semiprimitive recreation opportunities will continue. Practically all acres remain available for wilderness at the end of decade 1. The current mix of recreation use will be maintained.

High-value old growth is scheduled for early removal; however, due to long rotations significant old growth will be maintained. Economic efficiency is poor since timber harvest is limited to expensive aerial systems. Removal of large old-growth pine is efficient but other species may not be.

Mineral and energy exploration and development is an appropriate use but would be difficult due to the lack of road access.

Transitory forage for livestock is created by timber harvest.

Nonpriced benefits and costs include:

- A high level of visual quality will be retained.
- Future consideration for semiprimitive recreation or wilderness will be retained.
- Vegetative diversity tends towards a balance in age classes including old growth.
- Water quality and fisheries remain at high levels.
- Unroaded big-game security areas are retained.
- The present mix of recreation opportunities are maintained.

From a social and economic standpoint, timber is available to support the wood products industry. Mining is compatible with the emphasis although costs to the miners would be high due to lack of road access. Although the naturalness of the area would be impacted, the roadless character would not be foregone, and current semiprimitive recreation uses would be supported.

## IX. STONY MOUNTAIN ROADLESS AREA

This area is identified by number 01808. RARE II numbers were L1BAD and 01808. Roadless areas are:

National Forest	Gross Acres	Net Acres
Bitterroot	43,720	43,720
Lolo	34,930	34,930
Deerlodge	<u>24,696</u>	<u>24,616</u>
Total	103,346	103,266

#### A. Description

The area lies along the crest of the Sapphire Mountains in Ravalli and Granite Counties of west central Montana. Welcome Creek Wilderness lies several miles to the north and the Quigg Peak and Sapphire roadless areas are immediately adjacent to the east and south (see map). Remaining lands adjacent to the boundary have been developed for minerals, timber production, agriculture, or recreation.

The area is about 25 miles south of Missoula and equidistant between Hamilton and Philipsburg. Access is provided at many points along the boundary by Montana State Highway 38 and from Forest roads in Rock, Burnt Fork, Willow, and Gird Creeks. A network of about 20 trails provides access within the area along most major drainages and ridgetops. The Palisade Mountain and Easthouse National Recreation Trails occur in the area.

The area extends 18 miles along the Sapphire Mountain crest, the area's dominant feature, which bisects the area. Width averages about 10 miles, however, a roaded intrusion in Signal Creek pinches the central section to about 6 miles. About 20 percent of the boundary is topographically well-defined by ridgetops or stream bottoms. The remaining boundary is midslope lying above or below existing roads or timber harvest and minerals development.

Elevations range from 5,000 feet along the boundary to 8,700 feet at Dome Shaped Mountain, with about 40 percent of the area above 7,000 feet. Drainage headwaters adjacent to the crest, breaklands above major streams, and most of the northern half of the area are extremely rocky, including the entire Burnt Fork, Flat Rock, Upper Willow drainages, and from Eagle Creek to the north boundary on the Rock Creek side.

Several large natural meadows break the landscape in the Skalkaho Basin near the south boundary. Most of the remaining area is forested with Douglas-fir and lodgepole pine. Higher ridges are predominantly whitebark pine and stream bottoms contain Englemann spruce. Ground cover is mainly grass on severe southand west-facing exposures; snowberry, ninebark, and beargrass on drier sites; willow, redosier dogwood, and menziesia on cool, moist sites; and grouse whortleberry or woodrush on severe sites above 7,000 feet. A diversity of native grasses and forbs comprise the meadow vegetation in Skalkaho Basin and Upper Burnt Fork.

Slopes are steep throughout, with the exception of about 10,000 acres of gently rolling land between Wyman and Eagle Creeks.

Geology and soils are complex. Granitic intrusives are found in the Eagle/Wyman Creek area, limestones in Gold/Willow Creek, glacial deposits in upper Burnt Fork, and a variety of more resistant argillites and quartzites elsewhere. Preliminary geologic mapping indicates the presence of numerous faults.

Five small lakes and numerous potholes dot the southern portion of the area. Better known streams are Burnt Fork, Daly, and Willow Creeks all flowing west into the Bitterroot River and Stony, Wyman, Eagle, Hutsinpilar, and Alder Creeks flowing east into Rock Creek.

## B. Analysis of Wilderness Suitability

#### 1. Wilderness Attributes

## a. Natural Integrity and Appearance

Activities that have significantly altered natural processes are minimal and generally confined to old minerals prospects. There is exploration and some placer work near the boundary in Gold, Wyman, and Stony Creeks, and Skalkaho Mountain. An old flume, ditches, and deteriorated cabins are associated with placer operations in Stony Creek. The above impacts cover an insignificant acreage, are widely dispersed, historical in nature (50 years or older), with recovery nearly complete. The only significant current impact is a jeep trail leading to a cabin and mineral prospect in the headwaters of Gold Creek. The trail is approximately 2 1/2 miles long. Minor portions have been graded to accommodate jeep travel. There is also a dozer trail along the Sapphire Crest from the north boundary to Eagle Point and then east for about 1 mile.

Most of the old minerals activity would not be apparent to most visitors. The most extensive workings are readily apparent when onsite; however, they are historical and not objectionable. The remainder of the area appears natural.

## b. Opportunities for Solitude

The area is moderately well-screened from civilization and development by topography and its relatively large and compact size. However, about 20 percent of the area has boundaries at midslope either above or below existing development where civilization appears close at hand. The core of the area—Hutsinpilar, Eagle, and Wyman Creeks—plus the headwaters of other major drainages such as Stony, Willow, Daly, and the Burnt Fork, are well-protected by topography with good opportunities for solitude. This portion constitutes about 50 percent of the area. Opportunities for solitude are moderate in the rest of the area where roads intrude into the lower portions of drainages such as Williams Gulch and the Burnt Fork.

#### c. Primitive Recreation Opportunities

These are hiking; horseback riding; big- and small-game hunting; fishing; viewing a moderate diversity of vegetation, wildlife, geology; and historic mining activity. The combination of accessible drainage bottoms, gentle ridges, and open parklike meadows provides opportunities for cross-country travel.

#### d. Other Features

The 25,000-acre Skalkaho Game Preserve offers visitors the opportunity to view and photograph elk, goats, and other wildlife in their natural environment. Unique features are the massive rock rubble slopes of Boulder Basin; glacial cirques along the Sapphire Mountain crest; historical evidence of mining activity; the large natural meadows in Skalkaho Basin; extensive areas of whitebark pine, alpine larch; and wide panoramas from the major ridges.

## 2. Manageability and Boundaries

The following adjustment in net acres has taken place since the RARE II inventory.

	Natı	onal For	est	Total
Adjustment	<u>Bıtterroot</u>	<u>Lolo</u>	<u>Deerlodge</u>	<u>Acres</u>
RARE II Inventory	49,800	32,120	24,400	107,320
Developed or under contract	-8,188			-8,188
Land added to inventory	+800			+800
Refined acreage calculation	+1,308	+1,810	+216	+3,334
Current inventory	43,720	34,930	24,616	103,266

## C. Availability for Wilderness

## 1. Resource Potential and Use

Table C-21 Stony Mountain Roadless Area Resource Potential and Use

<b>a</b> .	77	D	-Forest	* *	m. · →
Category	Unit	Bitterroot	Deerlodge	Lolo	Total
Gross area	Acres	43,720	24,696	34,930	103,346
Net area	Acres	43,720	24,616	34,930	103,266
Recreation					
Primitive	RVD's	0	0	0	(
Semiprim. nonmotor.	RVD's	0	1,100	2,800	3,900
Semiprim. motor.	RVD's	2,800	2,000	0	4,800
Roaded natural	RVD's	400	0	0	400
Wıldlıfe habitat Elk & deer					
Summer range	Acres	40,730	23,506	34,298	98,53 <sup>1</sup>
Winter range	Acres	2,990	1,110	632	4,73
Rocky mountain goat	Acres	7,000	1,000	2,000	10,000
Bighorn sheep	Acres	0	0	0	(
Fisheries streams	Miles	35	12	4	53
Lakes	Number	4	1	0	<u> </u>
Fisheries lakes	Acres	35	10	0	43
Water developments	Number	1	0	0	-
Livestock range					
Current use	AUM's	0	1,027	0	1,027
Surtable rangeland	Acres	0	5,137	0	5,137
Current allotments	Number	0	4	0	1
Other suitable	Acres	0	0	0	(
<b>limber</b>					
Tentatively suitable	Acres	18,646	16,431	17,198	52,275
Standing volume	MMBF	181.7	103.2	127.3	412.2
Corridors					
Existing/potential	Number	0	0	0	(
Mineral potential					
Very high	Acres	2,300		0	2,300
High	Acres	122	0	0	122
Moderate	Acres	41,298	1,340	12,585	55,223
Low	Acres	0	23,266	22,345	45,611
Mining claims	Number	19	11	9	39
Oil & gas potential	_		_	_	_
Very high	Acres	0	0	0	C
High	Acres	0	0	0	0
Moderate	Acres	0	0	0	400.000
Low	Acres	43,720	24,616	34,930	103,266
Leases	Number	22	11	21	54
Leased area	Acres	42,960	18,170	31,400	92,530

#### 2. Selected Resource Values

#### a. Recreation

Current light use includes big-game hunting, fishing in the area's major streams and several cirque lakes, hiking, horseback riding, and viewing alpine vistas at higher elevations. Flatter ridge trails receive minor trailbike use. Big-game hunting is the primary use except in the Skalkaho Game Preserve.

#### b. Wildlife

The Skalkaho Game Preserve contains the best summer/fall elk habitat in the Sapphire Mountains, and a large herd summers in this area. Other common biggame species are moose, mule deer, black bear, and mountain goat. Less common are white-tail deer, mountain lion, and bighorn sheep. A great diversity of small animals and birds ranging from wolverines and golden eagles to small mice and ruby-crowned kinglets are permanent or seasonal occupants. Larger streams and three lakes support fishable populations of cutthroat and eastern brook trout. Arctic grayling occur in Fuse Lake.

#### c. Water

Water from streams flowing west into the Bitterroot River are used extensively for irrigation; however, the only water development within the area is Gleason Lake dam and reservoir. Eastward flowing streams are tributaries of the nationally renowned Rock Creek fishery.

#### d. Livestock

Suitable lands are found in Stony Creek where four allotments provide about 1,027 animal unit months of grazing.

#### e. Ecology

Varied geology, aspect, elevation, and past alpine glaciation contribute to a diversity of ecosystems.

### f. Timber

Standing timber volume is estimated at 412 MMBF and about 51 percent of the area is potentially suitable for timber production. Except for lower elevation fringes and drainage bottoms, timber potential is considered low primarily because of costly access associated with steep slopes and broad expanses of rock. Unsuitable lands are concentrated along the Sapphire Mountain crest, on other lateral ridges in the headwaters of major drainages, and in the northern third of the area which is extremely rocky.

#### g. Minerals and Energy Resources

Hardrock mineral potential is low to moderate. Gold, Stony, Wyman and Spring Creeks, Williams Gulch, and the Sapphire Crest in the extreme northern portion are rated as moderate potential because of past prospecting and exploration work. About 2,600 acres in the vicinity of Skalkaho Mountain has a high potential. Although 89 percent of the area is leased, traditional theories place the oil and gas potential as low.

#### h. Cultural

The flume, ditches, and cabins associated with placer operations in Stony Creek are of historic interest; however, little else is known about cultural resources.

#### 1. Land Use Authorizations

There are two outfitter permits and a permit for the maintenance and operation of the Gleason Lake dam and reservoir.

### j. Non-Federal Lands

There are 80 acres of private land in Stony Creek.

#### k. Other Considerations

## (1) Fire

Fire occurrence is low to moderate and the potential for large intense fires is moderate due to heavy accumulations of down fuels, particularly in lodgepole pine stands that were decimated by mountain pine beetles in the 1930's.

#### (2) Insects and Disease

Insects and diseases are generally endemic; however, dwarf mistletoe reduces annual growth in some areas as does spruce budworm, a recurrent pest. There are also areas of high-risk lodgepole pine that will become increasingly susceptible to mountain pine beetle attack.

## D. Need

### 1. Proximity to Existing Wilderness and Population Centers

See Tables C-1 and C-2.

#### 2. Contribution to the Wilderness Preservation System

Classification as wilderness would add ecosystems which are well-represented in existing wilderness. It would add meadows which are lacking or very rare in other nearby wilderness. Climax forest wildlife such as pine marten and pileated woodpecker would benefit, and unroaded security areas for elk, goats, and other big-game animals would be maintained.

#### 3. Public Interest

In the 1983 public involvement on roadless area, most of the public support was for wilderness classification primarily because of wildlife, watershed, fisheries, and recreation values; to relieve pressure on the Selway-Bitterroot Wilderness; to provide elk sanctuary; it is a large area; and it includes two National Recreation Trails. Those favoring roadless most often mentioned the wildlife values and trail system. Comments favoring development mention high timber values, minerals and grazing potential.

The 1983 Wilderness Coalition's Alternative supports wilderness for the area.

Montana's governor recommended about 66 percent of the area for wilderness (Schwinden, 1984). No wilderness was proposed in the Montana state bill (S. 2850) of 1984.

The following comments from 1983 public involvement portray how the area is valued (Planning Record: Roadless Area Evaluation Public Response Summary):

"The ruggedness and size of the area is a treasure not to lose."

"This area is teeming with wildlife."

"Includes the Game Preserve and a lot of it is dog hair lodgepole pine and alpine fir. It is high elevation country and some of the last that big-game can hide in. Lots of the places are rock slides and shallow soiled rocky areas that are very poor for timber."

". . . ruggedness of much of the area, the large size of the whole which provides ample opportunity for solitude and primitive recreation, the rich variety of wildlife including the large goat population, and its importance as a watershed for the Deerlodge and Bitterroot Valleys."

For these same reasons, there was also support for managing the area for roadless recreation.

Supporters of nonwilderness management cited timber potential as the prime resource: "wilderness reduces the potential timber base and wood products suffers," and "wilderness contributes little to the state's economy."

In RARE II, approximately 64 percent of responses on the RARE II DEIS supported wilderness for the area. The majority of local publics supported nonwilderness in the unit planning process, although not necessarily development options. In that process there appeared to be strong local support for unroaded management for a large portion of the area, but with less restrictions than for wilderness.

The majority of comments on the Bitterroot Forest Plan DEIS were opposed to any semiprimitive or wilderness designations. The primary reasons were to assure an adequate supply of logs to mills as a vital part to the Bitterroot's economy, and there is more than adequate wilderness. Most of these respondents did not mention specific roadless areas, whereas those opposed to development did. Comments specific to this roadless area favored wilderness because of high scenic value, uniqueness, presence of Skalkaho Game Preserve, and varied geology that is different than the Idaho batholith where most of the Bitterroot wilderness lies.

During public review of the Lolo Forest Plan DEIS, many comments were received in support of including this area in the National Wilderness Preservation System. Many respondents indicated support for retaining the area as a roadless area, if not designated for wilderness. Others preferred this area be managed as designated in the proposed Forest Plan - primarily Management Area 11, which is primitive, roadless management. Comments were received that opposed any additional wilderness. Few respondents specifically opposed wilderness designation for this area.

The response to the 1985 Deerlodge Forest DEIS and Proposed Forest Plan was heavy support for wilderness from one segment of the public. Other comments supported the designation in the Forest Plan or were opposed to any new wilderness.

## E. Alternatives and Environmental Consequences

## 1. Management Emphasis by Alternative

Management prescriptions requiring roads have been grouped into a roaded management emphasis because roads preclude wilderness classification. The semi-primitive recreation emphasis will maintain the roadless character. Management prescriptions in which roads are permissible but not needed to accomplish management activities have been grouped into an unroaded emphasis. The lands assigned to this emphasis are generally interspersed in the roaded emphasis lands and may be crossed by roads.

Similar alternatives for the Lolo, Deerlodge, and Bitterroot National Forests have been combined. Table C-22 displays total acreage assignment by management emphasis, and development by decade, for matched Forest alternatives. Table C-23 shows suitable timberland and mineral potential acreage, by management emphasis and alternative.

Section E2 uses Bitterroot Forest alternative names but describes the entire roadless area.

Table C-22 Management Emphasis (Stony Moutntain) (thousand acres)

Management											ernat								
•	tterroot	A		В	(		E			1		2	F		G		H		J
Lo	lo erlodge	c		C C	(		D M		D N		D x	  -1	A		F		G K		G J
	errouge									· —									
Nonwilderness designation		103	1 10	3 1	103	; 1	103	2	103	2	103	2	103	1	20	4	6	5	
Roaded Emphasis		57	0 5	7 0	49	9	28	5	26	1	24	0	37	1	18	7	4	6	
Bitterroot Forest		27	2 2	7 2	20	1	14	3	14	3	10	7	18	4	13	7	Ŀ	6	
Lolo Forest		19	5 1	9 5	19	5	4	0	4	0	4	0	14	2		0		0	
Deerlodge Forest		10	3 1	0 3	10	3	10	2	7	8	9	3	4	5		0		0	
Unroaded Emphasis		1	9	19	1	9	2	2	2	2	4	5	2	2		0		0	
Bitterroot Forest			0	0		0		0		0	2	3		0		Q		0	
Lolo Forest			0	Ç		0		0		0		0		0		0		0	
Deerlodge Forest		1	9	19	1	9	2	2	2	2	2	2	2	2		0		0	
Semiprimitive recreation Em	nphasis	44	2 4	4 2	51	3	72	5	74	9	74	7	63	8	1	7	1	9	
Bitterroot Forest		16	5 1	65	23	6	29	4	29	4	30	7	25	3	1	7	1	9	
Lolo Forest		15	4 1	5 4	15	4	30	9	30	9	30	9	20	7		٥		o	
Deerlodge Forest		12	3 1	2 3	12	3	12	2	14	6	13	1	17	8		0		0	
vilderness designation			D	0		0		0		0		0		0	82	8	96	7	102
Bitterroot Forest			)	0		Q		0		O		0		٥	23	3	37	2	43
Lolo Forest			0	0		0		0		0		0		0	34	9	34	9	34
Deerlodge Forest			)	0		0		0		0		0		0	24	6	24	6	24
rea developed by																			
Decade 1		16	0 1	5 7	7	1	8	7	8	7	2	7	10	2	3	7		0	
Bitterroot Forest		13	3 1	36	5	0	7	1	7	1	1	0	9	2	3	7		0	
Lolo Forest			)	0		0		0		0		0		0		0		0	
Deerlodge Forest		2	ι :	2 1	2	1	1	6	1	6	1	7	1	0		0		0	
Decade 5**		60	3 6	0 3	46	6	21	8	21	8	24	0	37	1	18	7	4	6	
Batterroot Forest		33	3.	38	20	1	14	3	14	3	10	7	18	4	18	7	4	6	
Lolo Forest		19	5 1	9 5	19	5	4	0	4	0	4	0	14	2		0		D	
Deerlodge Forest		7	,	7 0	7	0	3	5	3	5	9	3	4	5		0		0	1
rea roadless in *																			
Decade 1		87	2 8	7 5	96	1	94	5	94	-	100	5	93	0	16	7	6	5	4
Bitterroot Forest		29	3 3	1	38	7	36		36	6	42	7	34	5	16	7	6	5	(
Lolo Forest		34 4	) 3 <sup>1</sup>	<i>b</i>	34	9	34	9	34	9	34	9	34	9		0		0	i
Deerlodge Forest		22	5 23	2 5	22	5	23	¢	23	0	22	9	23	6		0		0	
Decade 5**		43 (	4)	3 0	56	7	81	4	81	5	79	2	76	1	1	7	1	9	
Bitterroot Forest		9 9	,	9	23	6	29	4	29	4	33	0	35	3	1	7	1	9	
Lolo Forest		15	19	5 4	15	4	30	9	30	9	30	9	20	7		0		0	(
Deerlodge Forest		17	11	7 7	17	7	21	1	21	2	15	3	20	1		0		0	(
urrent roadless acres		103 2	10	} 2	103	2	103	2	103	2	103	2	103	2	103	2	103	2	103
Bitterroot Forest		43 7	43	7	43	7	43	7	43	7	43	7	43	7	43	7	43	7	43 1
Lola Forest		34 9	34	9	34	9	34	9	34	9	34	9	34	9	34	9	34	9	34 9
Deerlodge Forest		24 6	2/	6	24	6	24	6	24	6	24	6	24	6	24	6	24	6	24 6

<sup>\*</sup> Does not include Wilderness designations

<sup>\*\*</sup> Values shown for Decade 1 are planned outputs and effects - Values shown beyond Decade 1 are projections of the outputs and effects expected if the alternatives were selected to continue beyond the first decade

Table C-23
Suitable Timberland and Mineral Potential (Stony Mountain) (thousand acres)

Management							Alt	ernative					
Emphasis Bi	ttcrroot	A	В	Ċ	E	3	E1	E2	F	G	li	J	
Lol	Lo	С	С	С	r	D D	D	D	Α	F	G	G	
Des	erlodge	С	c	c		1		M-1	A	1	к	J	
Tentatively suitable land													
Roaded emphasis		46 1	46 1	41	4 23	4	21 0	21 2	27 4	10 2	3 0		
Bitterroot Forest		18 6	18 6	_		6	9 6	8 3	12 2	10 2	30		
Lolo Forest		17 2	17 2	- •		6	3 6	3 6	10 7	0	0		
Deerlodge Forest		10 3	10 3			2	7 8	93	4 5	0	0		
Unroaded emphasis		2	2		2	2	2	7	2	0	0		
Bitterroot Forest		0	0		5	0	0	5	0	0	0		
Lolo Forest		0	0	,	ס	0	0	Ó	0	0	0		
Deerlodge Forest		2	2	:	2	2	2	2	2	a	0		
Semiprimitive recreation em	inhasis	5 9	5 9	10 7	- 7 28	6	31 0	30 4	24 6	n	6		
Bitterroot Forest	· <b>F</b> 11-11-1-1	0	0			0	9 0	9 9	6 4	0	6		
Lolo Forest		0	0				13 6	13 6	6 5	0	0		
Deerlodge Forest		5 9	5 9	5 9	_	o	8 4	6 9	11 7	0	a		
Wilderness emphasis		0	Ó		_	0	0	0	0	42 0	48 6	51	
Bitterroot Forest		0	0	Ċ	)	0	0	0	0	8 4	15 0	18	
Lolo Forest		0	0	(	)	0	0	0	0	17 2	17 2	17	
Deerlodge Forest		0	0	c	)	0	0	0	0	16 4	16 4	16	
High mineral potential													
Roaded emphasis		1 4	1 4	7	7	3	3	16	7	1 1	5		
Bitterroot Forest		1 4	1 4	7	,	3	3	1 6	7	1 1	5		
Lolo Forest		0	0	c	)	0	0	0	0	0	0		
Deerlodge Forest		0	0	C	)	0	0	0	0	0	0		
Unroaded emphasis		0	٥	ε	)	4	4	4	0	0	0		
Bitterroot Forest		0	0	c	)	4	4	4	0	0	0		
Lolo Forest		0	0	C	)	0	0	0	0	0	0		
Deerlodge Forest		0	0	c	)	0	0	0	0	0	0		
Semiprimitive recreation em	phasis	1 2	1 2	1 9	1	9	19	6	19	0	0		
Bitterroot Forest		1 2	1 2	1 9	1	9	19	6	19	0	0		
Lolo Forest		0	0	C	)	0	0	0	0	0	o		
Deerlodge Forest		0	0	c	1	0	0	0	0	0	0		
Wilderness emphasis		0	0	c	)	0	0	0	0	15	2 1	2	
Bitterroot Forest		0	0	C	)	0	0	0	0	15	2 1	2	
Lolo Forest		0	0	٥	•	٥	0	Đ	O	0	٥		
Deerlodge Forest		0	0	c	ı	0	0	0	0	0	0		

#### 2. Impacts

a. Designation: Wilderness
Management Emphasis: Wilderness

Virtually the entire area is recommended for wilderness in Alternative J with recommendations of 80 and 94 percent in Alternatives G and H. Recommendations would expand the wilderness system as a new wilderness. The area with high wilderness attributes is recommended for wilderness classification in Alternative G, and H and J include additional land with low to moderate attributes.

Timber production is precluded on all tentatively suitable timberland in Alternative J, 81 percent in G and 94 percent in H. All tentatively suitable timberland is three percent of the total for the Bitterroot NF, one percent of the Lolo, and three percent of the Deerlodge.

Wilderness classification would preclude semiprimitive recreation emphasis designation in Alternative J and would reduce the acreage available in G and H. Recreation use would continue to be dominated by hunting, fishing, and camping. Mechanized trailbike, snowmobile, and chain saw use would be prohibited.

Mineral and energy exploration and development is foreclosed subject to valid existing rights. All land rated as having a high mineral potential is withdrawn from mineral entry in Alternative J and 58 and 81 percent in G and H respectively.

Nonpriced benefits and costs include:

- A natural level of visual quality is maintained.
- The wilderness system is expanded.
- A natural level of big-game forage and cover is maintained. Cover/forage ratios would be determined by natural events such as wildfire.
- Vegetative diversity tends toward old growth as modified by wildfire.
- Old-growth dependent wildlife species are favored.
- Natural levels of watershed and fisheries are maintained.
- Local wood products employment is decreased.

Economic and social effects vary depending on the amount of tentatively suitable timberland recommended for wilderness. The wood products and mining industry would not be supported by this emphasis. Wilderness designation could attract more tourism and enhance outfitter activities. Publics interested in wilderness and primitive recreation opportunities would be supported, whereas those favoring mechanized use in a natural setting would not.

## b. Designation: Nonwilderness Management Emphasis: Roaded

Timber, range, winter range, partial retention, retention, and riparian prescriptions are in this management emphasis on the Bitterroot. The Lolo has included timber/range, wildlife (other), visual, miscellaneous, and riparian prescriptions. Deerlodge prescriptions include timber, timber/wildlife, and timber/wildlife/range. Some land is included in this emphasis in all alternatives except J. The highest levels are in A and B where about 55 percent of the roadless area is in this emphasis. The lowest is in Alternative H at 4 percent.

Eighty-eight percent of tentatively suitable timberland is assigned the roaded emphasis in Alternatives A and B; 77 percent in C; about 45 percent in E, E2, and F; 20 percent in G; and 6 percent in H. High value old growth is scheduled for early removal; however, due to long rotations, old growth will be retained above the minimum level in partial retention, retention, and riparian prescriptions. Early harvest is also scheduled in lodgepole pine stands which occupy much of the area.

Roads and timber harvest will foreclose future consideration for wilderness by the end of the fifth decade; however, between 82 and 98 percent of the land will remain unroaded and undeveloped at the end of decade 1. Roads would reduce the naturalness and solitude of the area. Semiprimitive recreation use would be disrupted as the recreation setting changes to roaded natural.

Access for mineral and energy exploration is enhanced as the road system expands. Over 50 percent of the land having high mineral potential would be accessible in Alternatives A and B; about 25 percent in C, F, and H; 42 percent in G; and 12 percent in E, E1, and E2.

Transitory forage for livestock and wildlife would be created by timber harvest.

Nonpriced benefits and costs on the land designated to roaded emphasis include:

- Visual quality will be at the lowest level (maximum modification) in Alternatives A, B, and H, and the highest level in G.
- Characteristics for future consideration as wilderness or semiprimitive recreation are foregone by the end of the fifth decade.
- Security cover for elk and other game will be greatly reduced in Alternatives A, B, and C; however, road closures will mitigate this effect.
- Vegetative diversity tends toward younger age classes in Alternatives A, B, C, E, E2, and H, but retains a sizeable range in G.
- Water quality is reduced, but mitigated by high road construction and maintenance standards.
- Local wood products employment increases significantly in Alternatives A, B, and C; remains at current levels in E, E2 and F; and declines in G and H.

Economic effects vary by the amount of land developed for timber production and the degree of constraints imposed for visual, wildlife, and watershed values. The greatest positive effects occur in Alternatives A, B, and C where most tentatively suitable lands are retained in the timber base with few constraints to protect other values. Publics favoring roadless or wilderness characteristics would not be supported; however, much of the area would remain like it is for another 10 years. Those publics using the area for semiprimitive recreation would have to adjust to a roaded setting or shift use elsewhere. Outfitters could continue operations although the hunting experience would be altered.

## c. Designation: Nonwilderness Management Emphasis: Semiprimitive Recreation

The semiprimitive recreation prescription is in this emphasis on the Bitterroot and Lolo, and the recreation prescription on the Deerlodge. Some land is included in this emphasis in all alternatives except J. About 50 percent of the area is assigned this emphasis in Alternatives C and F, and about 75 percent in Alternatives E and E2. In A and B, the emphasis includes a relatively large, high elevation area not suitable for timber production, or in the case of the Deerlodge, not efficient for timber production.

Roadless characteristics for a core area in Alternatives C, E, E2, F, and G will be retained and the land will remain available for future consideration as wilderness. The wilderness attributes of naturalness and solitude will also be maintained. The current mix of recreation use will continue. Trailbike, snow-mobile, and chain saw use are compatible with this emphasis.

Current levels of livestock use would continue.

Cover/forage relationships for wildlife will basically be determined by natural events such as wildfire, but can be modified by prescribed fire or direct habitat improvement.

Roads are not needed for surface management purposes but will be permitted for mineral activities where construction is justified on the basis of mineral showings or data, and where it is the next logical step in development of the mineral resource. Fifty percent of those lands having high mineral potential are assigned this emphasis in Alternatives A and B; and 73 percent in C, E, E2, and F.

Timber production is precluded on 21, 55, 55, and 47 percent of the tentatively suitable timberland in Alternatives C, E, E2, and F respectively. A minimal amount of tentatively suitable land is in this emphasis in Alternatives A and B. In C, assigned lands are primarily of low site quality. Less accessible lands of higher site quality are assigned in Alternatives E, E2, and F.

Nonpriced benefits and costs include:

- A nearly natural level of visual quality is maintained.
- The wilderness option is retained for future consideration.
- Nearly natural cover/forage ratios for big game are retained but may be modified by prescribed fire or other direct habitat improvement.
- Vegetative diversity tends toward old growth, but may be modified by prescribed fire.
- Old-growth dependent wildlife are favored.
- Natural levels of watershed and fisheries are retained.
- The current mix of recreation use is retained.
- Local wood products employment should be retained in Alternative E; would decrease in E2; and would increase in A, B, and C.

Economic and social effects vary by the amount of tentatively suitable timberland in this emphasis. The effect is greatest in Alternatives E, E2, and F, with no effect in A and B, and little in C. The wood products industry is not supported by this emphasis. Miners could continue to operate; however, costs would be higher without road access. Land would remain much like it is and current recreation use, livestock grazing, and outfitter use would continue.

# d. Designation: Nonwilderness Management Emphasis: Unroaded

The Deerlodge Forest wildlife, range/wildlife, and range prescriptions are included in this emphasis; and also the Bitterroot Forest min-level prescription in Alternative E2.

About 2,000 acres is included in this emphasis in Alternatives A, B, C, E, E1, E2, and F. Roads are permissible but not needed for management of surface resources.

Although much of this emphasis will remain unroaded, the overall effects are similar to roaded.

Naturalness will be reduced by range improvements such as drift fences and water developments.

Since these are mostly grasslands, the effect on timber production is insignificant.

Consideration for wilderness is foreclosed by the end of the fifth decade due to development in the surrounding roaded emphasis.

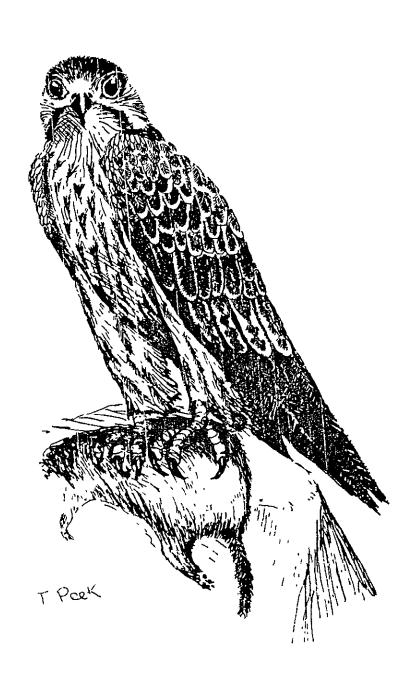
Forage for livestock and wildlife is maintained or enhanced by management.

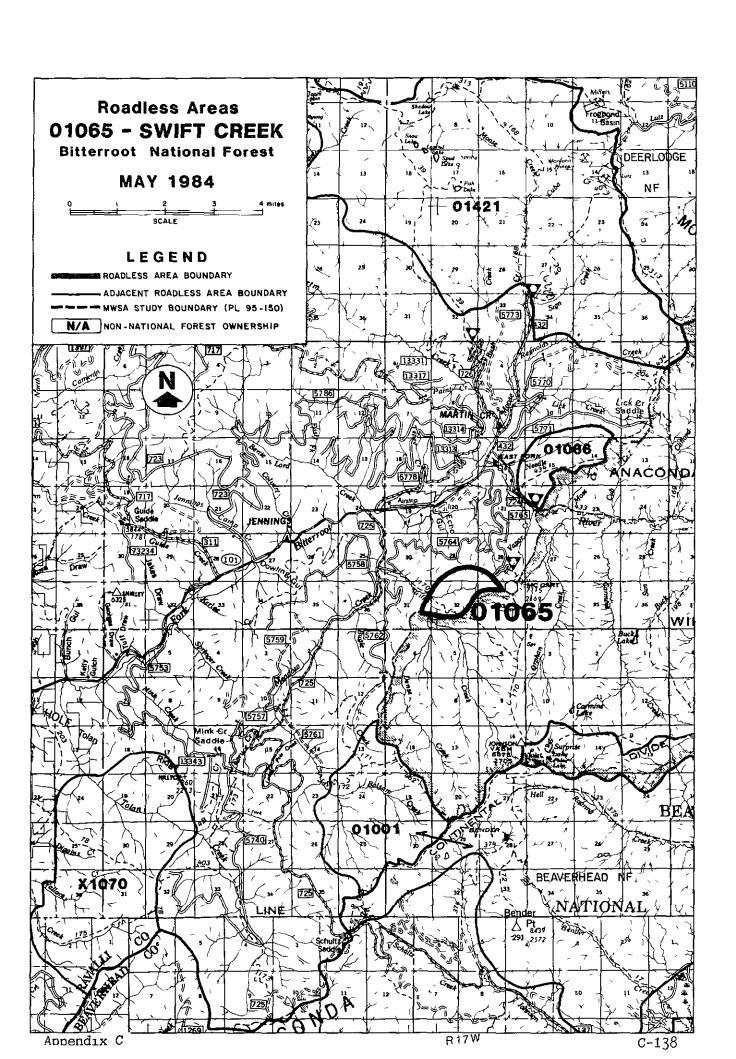
Mineral exploration and development is an appropriate use, but would be more expensive due to the lack of roads.

Nonpriced benefits and costs include:

- A high level of visual quality is maintained.
- The current mix of recreation use is retained.
- Water quality would be maintained.
- Future consideration for wilderness depends on the development within the surrounding roaded emphasis.
- Existing big-game security is retained.

From a social/economic standpoint, the range resource is maintained or improved, mining is compatible but with increased costs to the miner due to lack of roads, and the roadless character would be retained, thus supporting current semiprimitive uses. The recreation experience would be modified due to the proximity of roaded lands.





### X. SWIFT CREEK ROADLESS AREA

This area is identified by number 01065, the same as RARE II. Roadless area acreage is:

National Forest Gross Acres Net Acres

Bitterroot 744 744

#### A. Description

The roadless area is located in southeast Ravalli County; Montana. Hamilton, the county seat, is about 32 air miles to the northwest. The Anaconda-Pintler Wilderness borders the south boundary. Remaining lands outside the boundary have been developed for timber production. Access to the area is from U.S. Highway 93, the East Fork Road, and Forest roads along the boundary. The Swift Creek Trail passes through the middle of the area providing access to the adjoining wilderness.

The area includes a portion of Swift Creek, headwaters of which are in the adjoining wilderness. Elevations range from 5,600 to 7,000 feet.

Forests cover most of the area. Lodgepole pine is the primary tree species, with some large Douglas-fir and ponderosa pine on south facing slopes. Ground cover is mostly beargrass and huckleberry with Idaho fescue and pinegrass on warmer sites and open ridges.

#### B. Analysis of Wilderness Suitability

#### 1. Wilderness Attributes

#### a. Natural Integrity and Appearance

The natural integrity of this area is intact and the area appears natural to visitors.

#### b. Opportunities for Solitude

Opportunities for solitude are low because the area is small and proximate human activities are visible from within the area. Dense timber screens most views and reduces sounds of human activities, although these sounds occasionally penetrate the entire area. The adjacent Anaconda-Pintler Wilderness enhances solitude.

## c. Primitive Recreation Opportunities

While the opportunity to pursue primitive recreation exists, the lack of special attractions or unique features has limited recreation use primarily to hunting. Challenging opportunities are rare.

### d. Other Features

The area contains no special features.

## 2. Manageability and Boundaries

The adjoining Anaconda-Pintler Wilderness is 157,874 acres. The boundary between the roadless area and the Anaconda-Pintler Wilderness follows finger ridges as it crosses Swift Creek. Addition of the area to the Anaconda-Pintler Wilderness would put the new boundary along a main ridge on the north then down a finger ridge, across Swift Creek, and back up a finger ridge to the current Anaconda-Pintler boundary. It would add a small acreage to the existing wilderness but would not contribute to a better topographic boundary.

The following adjustments in acreage has taken place since the RARE II inventory:

Adjustment	<u>Unit</u>	Total
RARE II Inventory	Acres	700
Refined Acreage Calculation	Acres	+44
Current Inventory	Acres	744

## C. Availability for Wilderness

## 1. Resource Potential and Use

Table C-24 Swift Creek Roadless Area Resource Potential and Use

Category	Unit	Bitterroot Forest
Gross area	Acres	744
Net area	Acres	744
Recreation	·-	• • •
Primitive	RVD's	0
Semiprim. nonmotor.	RVD's	100
Semiprim. motor.	RVD's	0
Roaded natural	RVD's	0
Wildlife habitat		
Elk & deer		
Summer range	Acres	744
Winter range	Acres	. 0
Rocky mountain goat	Acres	0
Bighorn sheep	Acres	0
Fisheries streams	Mıles	•3
Lakes	Number	ŏ
Fisheries lakes	Acres	0
Water develorments	Number	0
Livestock range		
Current use	AUM's	0
Suitable rangeland	Acres	0
Current allotments	Number	
Other suitable	Acres	0
Timber		
Tentatively suitable	Acres	684
Standing volume	MMBF	5.6
Corridors		_
Existing/potential	Number	0
Mineral potential		
Very high	Acres	0
High	Acres	0
Moderate	Acres	744
Low	Acres	0
Mining claims	Number	0
Oil & gas potential		
Very high	Acres	0
High	Acres	0
Moderate	Acres	0
Low	Acres	744
Leases	Number	0
Leased area	Acres	Ō

#### 2. Selected Resource Values

#### a. Recreation

Current use is very light consisting primarily of hunting and traveling through the area to the adjoining wilderness.

#### b. Wildlife

Elk, moose, mule deer, black bear, grouse, and numerous nongame animals and birds are common to the area. Swift Creek is large enough to sustain a catchable population of cutthroat trout. The area is on a fall migration route for elk that summer in the Big Hole Valley and winter in the East Fork of the Bitterroot.

#### c. Water

Streams flowing through the area contribute water for downstream irrigation.

#### d. Livestock

There is no current use nor are there suitable lands for grazing.

## e. Ecology

Varied topography, aspect, and elevations provide a moderate diversity of ecosystems that are well represented in existing wilderness.

#### f. Timber

Approximately 90 percent of the area is tentatively suitable for timber production. Standing timber volume is estimated at 5.6 MMBF. Site productivity is high due to the area's relatively low elevation.

## g. Minerals

A mineral survey has been complete (Elliott et al., in press; Wallace et al., 1983). Hardrock mineral potential is low. There are no known mining claims. Although oil and gas lease applications have been received for the entire area, no leases have been issued because the area has been recommended for wilderness in RARE II. Traditional theory places the oil and gas potential as low.

#### h. Cultural

Little is known about cultural resources.

## 1. Land Use Authorizations

There are no permits or other rights.

### 1. Non-Federal Lands

The area is entirely National Forest ownership.

#### k. Other Considerations

## (1) Fire

Fire occurrence and the potential for large fires is low.

#### (2) Insects and Disease

Insects and diseases are generally endemic; however, dwarf mistletoe reduces growth in some areas as does spruce budworm, a recurrent pest. Most of the area is covered by pole-sized lodgepole pine. As age increases, these will become increasingly susceptible to mountain pine beetle attack.

## D. Need

## 1. Proximity to Existing Wilderness and Population Centers

See Tables C-1 and C-2.

## 2. Contribution to the Wilderness Preservation System

The area would add a small acreage to the Anaconda-Pintler Wilderness. Ecosystems are well represented in existing wilderness.

#### 3. Public Interest

In the 1983 public involvement on roadless areas, most of the public interest was in wilderness because the area borders existing wilderness. One comment pointed out that 90 percent of the area is commercial forest land with high timber values.

In RARE II, 24 percent of the responses to the RARE II DEIS favored wilderness and 76 percent nonwilderness. The 1984 Montana Governor's recommendation (Schwinden, 1984) did not recommend wilderness for the area; however, the Montana State Bill (S. 2850) of 1984 did.

The majority of comments on the Forest Plan DEIS were opposed to any semiprimitive or wilderness designations. The primary reasons were to assure an adequate supply of logs to mills as a vital part to the Bitterroot's economy, and there is more than adequate existing wilderness. Most of these respondents did not mention specific roadless areas, whereas those opposed to development did. Comments specific to this roadless area favored wilderness designation for all or a portion of the area. The primary reasons were: it is not in the public interest to lose money on a timber road access program, and put other resources at risk; it is contiguous with the Anaconda-Pintler wilderness; and roadless areas are becoming an increasingly scarce resource.

## E. Alternatives and Environmental Consequences

## 1. Management Emphasis by Alternative

Management prescriptions allowing road construction have been grouped into the roaded management emphasis because roading will preclude wilderness. Conversely, the semiprimitive recreation emphasis will maintain the roadless, undeveloped character. Table C-25 displays total acreage assignment by management emphasis, and development by decade, for each alternative. Table C-26 shows suitable timberland and mineral potential acreage, by management emphasis and alternative.

Table C-25
Management Emphasis (Swift Creek)
(thousand acres)

Management		Alternative											
Emphasis	Bitterroot	Α	В	c	E	E1	E2	F	G	н	J		
Nonwilderness desi	gnation	7	o	0	7	7	7	0	o	0	0		
Roaded Emphasis		6	Q	0	7	7	7	0	0	0	0		
Unroaded Emphas	318	0	٥	0	0	0	0	0	0	0	0		
Semiprimitive :	recreation Emphasis	1	0	0	0	0	0	0	0	0	0		
Wilderness design	nation	0	7	7	0	0	0	7	7	7	7		
Area developed by	,												
Decade 1		0	0	0	0	0	0	0	0	0	0		
Decade 5**		7	0	0	7	7	7	0	0	0	0		
Area roadless in	*												
Decade 1		7	0	0	7	7	7	0	0	0	0		
Decade 5**		0	0	0	0	0	0	0	0	0	0		
Current roadless	acres	7	7	7	7	7	7	7	7	7	7		

<sup>\*</sup> Does not include wilderness designations

Table C-26
Suitable Timberland and Mineral Potential (Swift Creek)
(thousand acres)

anagement														
mphasis	Bitterroot	A	В	С	3	E1	E2	F	G	н				
entatively suita	ble land									_				
Roaded emphasi	s	6	0	0	7	7	7	0	0	0				
Unroaded empha	sis	0	0	0	0	0	0	0	0	0				
Semiprimitive	recreation emphasis	1	0	0	0	0	0	0	0	0				
Wilderness emp		0	7	7	0	0	0	7	7	7				

This area has no high mineral potential

<sup>\*\*</sup> Values shown for Decade 1 are planned outputs and effects. Values shown beyond Decade 1 are projections of the outputs and effects expected if the alternatives were selected to continue beyond the first decade

## 2. Impacts

Designation: Wilderness
 Management Emphasis: Wilderness

The entire area is recommended for wilderness in all alternatives except A, E, E1, and E2. Recommendations would increase the size of the adjacent Anaconda-Pintler Wilderness.

Timber production is precluded on all tentatively suitable timberlands in Alternatives B, C, F, G, H, and J. This amounts to  $68^{4}$  acres, or less than one percent of the Forest total.

Wilderness classification precludes semiprimitive recreation emphasis designation. Recreation use will continue to be dominated by hunting. Mechanized use such as trailbikes, snowmobiles, and chain saw use would be prohibited.

Mineral exploration and development is foreclosed subject to valid existing rights. None of the area has a high mineral potential.

Nonpriced benefits and costs are:

- A natural level of visual quality is maintained.
- The wilderness system is increased.
- A natural level of big-game forage and security cover is maintained.
- Big-game cover/forage ratios would be determined by natural events such as fire.
- Vegetative diversity tends towards old growth, but is modified by a more nearly natural role for wildfire.
- Old-growth dependent wildlife species are favored.
- Natural levels of watershed and fisheries are maintained.
- Local wood products employment decreases slightly in all alternatives except A, E, E1, and E2.

Economic and social effects vary depending upon the amount of tentatively suitable timberland in this emphasis. The effect is greatest in Alternatives B, C, F, G, H, and J but the total effect is low, since only about one-tenth of a percent of the Forest total tentatively suitable timberland is involved. The estimated volume of about 5 million board feet of timber would not be available. The wood products and mining industry would not be supported by this emphasis. Public interest in wilderness for the area and those using the area for semiprimitive recreation would be supported. Recreation use would continue to be dominated by hunting.

# b. Designation: NonwildernessManagement Emphasis: Roaded

The roaded management emphasis includes timber and range prescriptions. The entire area is in this emphasis in Alternatives E, E1, and E2, and 90 percent in A. All of this land is tentatively suitable timberland. High value old growth is scheduled for early removal. After the first decade, harvest is scheduled in lodgepole pine stands which blanket much of the area.

No roads will be built or timber harvested in the first decade, but by the end of the fifth decade the option for wilderness classification will be closed. The roadless character of the area would be altered and the naturalness and opportunities for solitude would be reduced. Present semiprimitive recreation use would be disrupted as the recreation setting shifts to roaded natural appearing.

Access for mineral and energy exploration is enhanced as the road system expands.

Transitory forage for wildlife is created by timber harvest.

Nonpriced benefits and costs include:

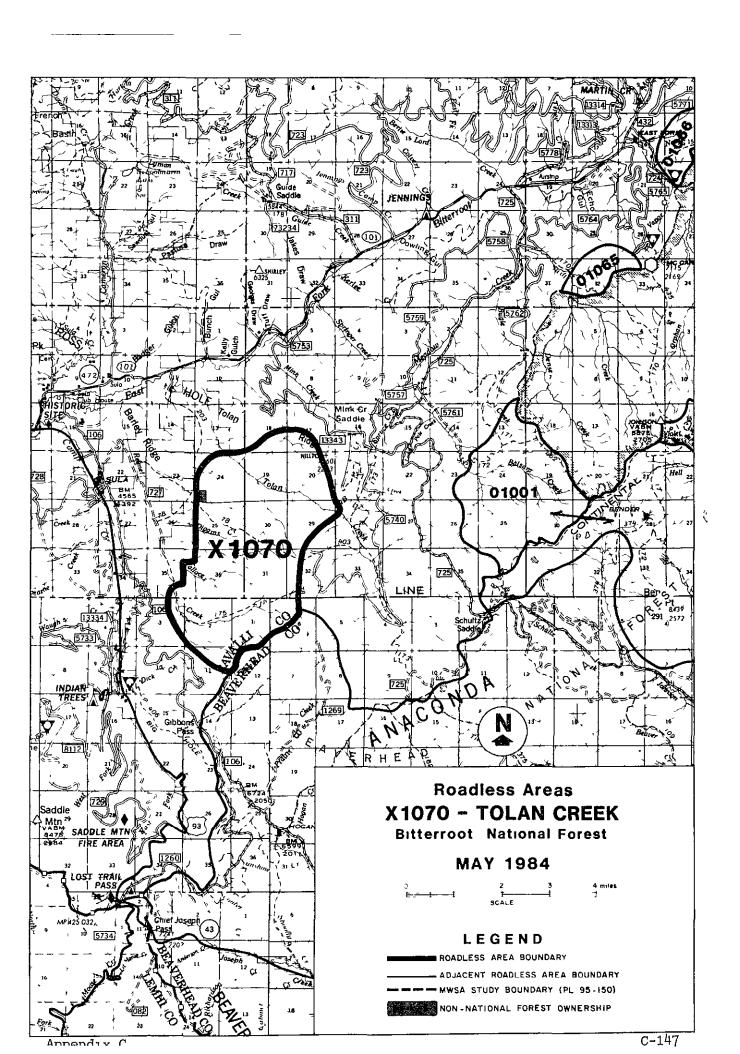
- Visual quality will be at the lowest level (maximum modification).
- Characteristics for future consideration of wilderness or semiprimitive recreation are foregone by the end of the fifth decade.
- Security cover for elk will be greatly reduced in Alternatives A, E, E1, and E2. Road closures could minimize the impacts on elk security.
- Vegetative diversity tends towards younger age classes.
- Local wood products employment is increased slightly.
- Water quality is reduced but mitigated by high road construction and maintenance standards.

Economic effects vary depending upon the amount of land that is suitable for timber production and the degree of constraints imposed to protect visual, wildlife, and watershed values. The greatest positive effect on the economy is for Alternatives A, E, E1, and E2, where all of the tentatively suitable lands are retained in the timber base. This is insignificant in terms of the Forest total. The wood products and mining industries would be supported. Publics favoring the roadless or wilderness characteristics would not be supported, although the area would remain much like it is for another 10 years. Those publics using the area for primitive and semiprimitive recreation use would have to adjust to a roaded natural setting or shift their use elsewhere.

# c. Designation: Nonwilderness Management Emphasis: Semiprimitive Recreation

Only the semiprimitive management prescription is in this emphasis. This emphasis is in Alternative A only. It is insignificant as only 100 acres are included. The effects on other resource values are inconsequential.





## XI. TOLAN CREEK ROADLESS AREA

This area is identified by number X1070. It was in a completed unit plan and consequently did not go through the RARE II process. Roadless area acreage is:

National Forest	Gross Acres	Net Acres
Bitterroot	7,128	7,088

#### A. Description

This roadless area is located in the southern end of Ravalli County, Montana. The county seat of Hamilton is about 35 miles to the northwest. It includes the middle portion of Tolan Creek. The headwaters have been developed by roads and the remaining lands outside the boundary for timber production. Access to the area is from U.S. Highway 93, the East Fork Road, and Forest roads along the boundary. Two trails provide access within the area and the Continental Divide forms the south boundary.

The area is about 4 miles long and 3 miles wide. Tolan Creek drains the eastern portion and Reimel Creek the western. Drainages are steep, V-shaped and separated by broad rolling ridgetops. Elevations range from 4,900 to 7,700 feet. About 20 percent of the area is above 7,000 feet.

Forests cover most of the area interspersed with large grassy balds on southand west-facing slopes primarily in the Reimel Creek drainage. Small areas of rock and talus slopes are common in the steepest portions adjacent to Reimel and Tolan Creeks. Ponderosa pine is common on south slopes and lower elevation ridgetops, Douglas-fir at midslope and lower elevation north slopes, and lodgepole pine and subalpine fir at higher elevations. Ground cover is mostly mixed grasses at lower elevations and beargrass at higher elevations.

#### B. Analysis of Wilderness Suitability

## 1. Wilderness Attributes

## a. Natural Integrity and Appearance

Natural integrity has been affected by range management activities including structural improvements such as drift fences and water developments, and by ridgetop jeep trails, otherwise the area appears natural.

## b. Opportunities for Solitude

Steep terrain and dense forest provide some solitude; however, civilization appears close at hand due to the areas small size and location of the boundary at midslope above existing roads and timber harvest.

### c. Primitive Recreation Opportunities

Opportunities for primitive recreation are limited due to the areas small size. Day use opportunities are provided. Participation in activities other than hunting are limited due to the lack of attractions. Challenging experiences are rare.

#### d. Other Features

There is evidence of historical Native American use along the ridgetops and scarred trees have been found in stands of larger ponderosa pine. There are no other attractions or unique features.

## 2. Manageability and Boundaries

The boundary for this area is on ridgetops and other identifiable features for about half its length. The remainder is midslope following section lines or above roads and timber harvest. There is no opportunity for boundary adjustment to enhance wilderness characteristics.

The following adjustments in net acres have taken place since the unit plan inventory:

Adjustments	<u>Unit</u>	<u>Total</u>
Unit plan inventory Developed Land added to inventory Current inventory	Acres Acres Acres Acres	9,400 -6,187 +3,867 7,088

## C. Availability for Wilderness

## 1. Resource Potential and Use

Table C-27 Tolan Creek Roadless Area Resource Potential and Use

Category	Unit	Bitterroot Forest
Gross area	Acres	7,128
Net area	Acres	7,088
Recreation		
Primitive	RVD's	0
Semiprim. nonmotor.	RVD's	0
Semiprim. motor.	RVD's	300
Roaded natural	RVD's	100
Wildlife habitat		
Elk & deer		
Summer range	Acres	1,308
Winter range	Acres	5,780
Rocky mountain goat	Acres	O
Bighorn sheep	Acres	0
Fisheries streams	Mıles	4
Lakes	Number	0
Fisheries lakes	Acres	0
Water developments	Number	0
Livestock range		
Current use	AUM's	200
Suitable rangeland	Acres	1,110
Current allotments	Number	2
Other suitable	Acres	0
Timber		
Tentatively suitable	Acres	4,729
Standing volume	MMBF'	51 <b>.1</b>
Corridors		
Existing/potential	Number	0
Mineral potential		
Very high	Acres	0
High	Acres	0
Moderate	Acres	7,088
Low	Acres	0
Mining claims	Number	0
Oil & gas potential		
Very high	Acres	0
High	Acres	0
Moderate	Acres	0
Low	Acres	744
Leases	Number	0
Leased area	Acres	0

#### a. Recreation

Current use is very light consisting primarily of big-game hunting. Participation in other activities is minimal due to the areas lack of attractions.

#### b. Wildlife

Elk, moose, mule deer, black bear, grouse, and numerous nongame animals and birds are common to the area. Elevations below 6,000 feet are elk and deer winter range and the Reimel Creek drainage is heavily used elk winter range. Tolan and Reimel Creeks sustain a small catchable-size trout population and provide spawning areas for fish moving out of the East Fork of the Bitterroot River.

#### c. Water

Water from the area is used extensively for downstream irrigation. The head-waters in Tolan Creek have been developed by timber harvest and/or roads. There has been some modification from natural conditions; however, water quality is excellent.

#### d. Livestock

The area contains parts of two grazing allotments for 200 animal unit months of use. All grassy balds and open ridgetops receive use. Range improvements include cross fences which break the area into pastures and reduce cattle/game competition for forage, and water developments.

#### e. Ecology

Varied topography, aspect, and elevations provide a moderate diversity of ecosystems that are well represented in existing wilderness.

#### f. Timber

About 66 percent of the area is tentatively suitable for timber production. Standing timber volume is estimated at 51 MMBF. Site productivity is generally high due to the areas low elevation.

#### g. Minerals

Hardrock mineral potential is moderate; however, there are no known mining claims. Traditional theory places the oil and gas potential as low.

#### h. Cultural

There is evidence of historic Native American use along open ridgetops and scarred trees have been found in stands of large ponderosa pine. Little else is known of cultural resources.

#### 1. Land Use Authorizations

There are two cattle grazing permits in the area.

#### Non-Federal Lands

Forty acres of state of Montana land lie along the west boundary and could be easily excised if the area were to become wilderness.

#### k. Other Considerations

## (1) Fire

Fire occurrence and the potential for large fires is low.

#### (2) Insects and Disease

Insects and disease are generally endemic; however, dwarf mistletoe reduces growth in some areas as does spruce budworm, a recurrent pest.

#### D. Need

### 1. Proximity to Existing Wilderness and Population Centers

See Tables C-1 and C-2.

## 2. Contribution to the Wilderness Preservation System

The area would add a small acreage as a new wilderness. Ecosystems are well represented in existing wilderness.

#### 3. Public Interest

There was little support for wilderness in the 1983 public involvement on roadless areas. Generally, people perceive the area as important for elk security, and most of the support was for unroaded management because the area "is in the center of a large well known elk producing country. Most of the Forest encircling this spot is heavily roaded." Rationale for development included: "wilderness removes economic potential and reduces the tax base "; and "...can't afford to let any more mills shut down"; and, there is high timber potential (Planning Record: Roadless Area Evaluation Public Comment Summary, 1983).

Montana's governor did not recommend wilderness (Schwinden, 1984) nor did the Montana state bill (S. 2850) of 1984.

The majority of comments on the Forest Plan DEIS were opposed to any semiprimitive or wilderness designations. The primary reasons were to assure an adequate supply of logs to mills as a vital part of the Bitterroot's economy, and there is more than adequate existing wilderness. Most of these respondents did not mention specific roadless areas, whereas those opposed to development did. Comments specific to the roadless area favored wilderness designation for all or a portion of the area. The primary reasons were: it is not in the public interest to lose money on a timber road access program and put other resources at risk; roadless areas are becoming an increasingly scarce resource; and the area is critical to migrating elk.

## E. Alternatives and Environmental Consequences

## 1. Management Emphasis by Alternative

Management prescriptions providing for roads have been grouped into the roaded management emphasis, since roading will preclude wilderness in the long term. Likewise, management prescriptions that provide for timber harvest but not roads are identified under an unroaded management emphasis. In this emphasis, timber sale activity would preclude wilderness in the short term but not necessarily in the long term, and the area would remain roadless but not undeveloped. Table C-28 displays total acreage assignment by management emphasis, and development by decade, for each alternative. Table C-29 shows suitable timberland and mineral potential acreage, by management emphasis and alternative.

Table C-28
Management Emphasis (Tolan Creek)
(thousand acres)

Management Emphasis											
	Α	В	C	Е	E1	E2	F	G	H	J	
Nonwilderness designation	7 1	7 1	7 1	7 1	7 1	7 1	7 1	7 1	7 1	0	
Roaded	7 1	7 1	7 1	7 1	7 1	6 7	2 8	0	7 1	0	
Unroaded	0	0	0	0	0	4	4 3	7 1	0	0	
Semiprimitive recreation	0	0	0	0	0	0	0	0	0	0	
Wilderness designation	0	0	0	0	0	0	0	0	0	7 1	
Area developed by											
Decade 1	7 1	7 1	7 1	7 1	7 1	3 3	7 1	7 1	7 1	0	
Decade 5**	7 1	7 1	7 1	7 1	7 1	7 1	7 1	7 1	7 1	0	
Area roadless in *											
Decade 1	0	0	0	0	0	38	0	0	Ó	٥	
Decade 5**	0	٥	0	0	0	0	0	0	0	0	
Current roadless acres	7 1	7 1	7 1	7 1	7 1	7 1	7 1	7 1	7 1	7 1	

<sup>\*</sup>Does not include wilderness designation

<sup>\*\*</sup> Values shown for Decade 1 are planned outputs and effects. Values shown beyond Decade 1 are projections of the outputs and effects expected if the alternatives were selected to continue beyond the first decade

Table C-29
Suitable Timberland and Mineral Potential (Tolan Creek) (thousand acres)

Management												
Emphasis	Bitterroot	A	В	С	E	E1	£2	F	G	Ħ		
Tentatively suital Roaded emphasis	ole land	47	47	47	4 7	47	47	2 3	0	47		
Unroaded emphasis	ıs	0	0	0	0	0	0	2 4	4 7	0		
Semiprimitive recreation emphasis		0	0	0	0	0	0	0	0	0		
Wilderness empha		0	0	0	0	0	0	0	O	0	4	

<sup>\*</sup>This area has no high mineral potential

#### 2. Impacts

a. Designation: Wilderness
Management Emphasis: Wilderness

The entire area is recommended for wilderness in Alternative J. This recommendation would expand the wilderness system by creating a new wilderness. Wilderness designation would enhance the area's wilderness attributes, since there are existing uses and facilities not usually associated with wilderness. The existing jeep trail (used administratively for range management) could be eliminated, as could other motorized activities associated with fence, water development, and trail maintenance.

Timber production is precluded on all tentatively suitable timberland, less than one percent of the Forest total. It would remove about 51 MMBF including a significant area of old-growth ponderosa pine.

Wilderness classification precludes semiprimitive recreation emphasis designation. Recreation use will continue to be dominated by hunting. Mechanized equipment such as trail bikes, snowmobiles, and chain saws would be prohibited.

Minerals exploration and development is foreclosed on all lands, subject to valid existing rights.

Current livestock grazing of 200 AUM's could continue on portions of two allotments in the area.

Big-game management would not change much, since most of the winter range forage is produced on permanent grassland. Thus, cover/forage relationships should not change over time, except as influenced by wildfire.

The nonpriced benefits are:

- A natural level of visual quality is maintained.
- The wilderness system is increased.
- A natural level of big-game forage and security cover is maintained.
- Big-game cover/forage ratios would be determined by natural events such as fire.
- Vegetative diversity tends towards old growth, but is modified by a more nearly natural role for wildfire.
- Old-growth dependent wildlife species are favored.
- Natural levels of watershed and fisheries are maintained.
- Local wood products employment decreases.

The 1 percent loss in timber volume can be mitigated by practicing intensive forestry elsewhere; however, the loss in old-growth ponderosa pine and its associated value can't be replaced.

The wood products and mining industry would not be supported by this emphasis.

Publics interested in wilderness for the area would be supported.

# b. Designation: Nonwilderness Management Emphasis: Roaded

Timber, range, winter range, partial retention, and riparian prescriptions are in this emphasis. Some land is included in this emphasis in all alternatives except G and J. Alternatives A, B, C, E, E1, and H have 100 percent of the roadless area in these emphases; Alternative F has 39 percent; and Alternative E2 has 94 percent.

Nearly all tentatively suitable timberland is assigned to the roaded emphasis in Alternatives A, B, C, E, E1, E2, and H and 33 percent is assigned in F. High value old growth is scheduled for early removal; however, due to long rotations, old growth will be retained above minimum levels in partial retention and riparian prescriptions. Harvest is also scheduled in lodgepole pine stands which blanket much of the area.

Roads and timber harvest will foreclose consideration for wilderness by the end of the first decade. Roads will alter the character of the area and reduce the naturalness and solitude of the area. Present semiprimitive recreation use would be disrupted as the recreation setting shifts to roaded natural.

Access for mineral and energy exploration is enhanced as the road system expands.

Transitory forage for livestock and wildlife is created by timber harvest.

Nonpriced benefits and costs include:

- Visual quality will be at the lowest level (maximum modification) in Alternatives A, B, C, E, E1, and H, and a moderate level in Alternative E2 and F.
- Characteristics for future consideration of wilderness or semiprimitive recreation are foregone by the end of the first decade.
- Security cover for elk will be greatly reduced; however, road closures could help maintain elk security.
- Vegetative diversity tends towards younger age classes.
- Local wood products employment increases in Alternatives A, B, C, E, E1, E2, and H and remains at current levels in F.

Economic effects vary depending upon the amount of land that is suitable for timber production and the degree of constraints imposed to recognize visual, wildlife, and watershed values. The greatest positive effect on the economy is for Alternatives A, B, C, E, E1, E2, and H where practically all of the tentatively suitable lands are retained in the timber base, but the effect would be slight since the area contains less than 1 percent of the Forest suitable timber base. The wood products industry would be supported. Publics favoring the roadless or wilderness characteristics would not be supported. Those publics using the area for primitive and semiprimitive recreation use would have to adjust to a roaded natural setting or shift their use elsewhere.

# c. Designation: Nonwilderness Management Emphasis: Unroaded

Unroaded retention and min-level are the management prescriptions in this emphasis. Alternatives E2, F, and G assign this emphasis to 6, 60, and 100 percent of the roadless area, respectively.

Timber harvest forecloses consideration for wilderness classification by the end of the first decade in Alternatives F and G. However, there will be no roads, and timber harvest alone will not cause long-term changes in the wilderness attributes. Timber harvest would be mostly by aerial means. Harvest is low due to long rotations. The current level and mix of recreation use will be maintained.

High value old growth is scheduled for early removal; however, due to long rotations, significant old growth will be maintained. Economic efficiency of this emphasis is poor in Alternatives F and G, since timber harvest is limited to expensive aerial systems. Removal of large old-growth pine is efficient but other species may not be.

Mineral exploration and development is an appropriate use but would be difficult due to the lack of road access. No lands rated as very high or high mineral potential are included in this emphasis.

Transitory forage for livestock is created by timber harvest.

Nonpriced benefits and costs include:

- A high level visual quality will be retained.
- Future consideration for semiprimitive recreation will be retained.
- Vegetative diversity tends toward a balance in age classes including old growth.
- Water quality and fisheries remain at high levels.
- Unroaded big-game security areas are retained.
- The present mix of recreation opportunities are maintained.

From a social and economic standpoint, the suitable timber is available, thus supporting the wood products industry. Mining is compatible with the emphasis although costs to the miners would be high without road access. Although the naturalness of the area would be impacted, the roadless character would not be foregone, thus supporting current semiprimitive recreation uses.

#### XII. REFERENCES

- Bosworth, D. (Letter to Forest Planning Officers). Followup on Forest meetings on roadless area evaluation and white paper. Missoula, MT: Northern Region, Forest Service, USDA; 1984 May 1.
- Lund, K.; Rehm, W.; Benham, J.R. Mineral resource potential of the Blue Joint wilderness study area, Ravalli County, Montana, and the Blue Joint roadless area, Lemhi County, Idaho. Denver, CO: Geological Survey, USDI; 1984.
- Schwinden, Ted. (Letter to Senator John Melcher). Helena, MT; 1984 May.
- Wallace, C.A.; Lidke, D.J.; Elliott, J.E.; Antweiler, J.C.; Campbell, W.L.; Hassemer, J.H.; Hanna, W.F.; Banister, D.P.; Close, T.J. Mineral potential of the Sapphire wilderness study area and contiguous roadless areas, Granite and Ravalli Counties, Montana. Denver, CO: Geological Survey, USDI; 1984.

## APPENDIX D

## PUBLIC COMMENTS AND FOREST SERVICE RESPONSES

Appendix D is not included in this document because of its bulk. It is available for review at the following office:

Forest Supervisors Office 316 North Third Hamilton, Montana 59840 (406) 363-3131