IV

ENVIRONMENTAL CONSEQUENCES

CHAPTER IV. ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter describes the environmental consequences of implementing the various Forest planning alternatives. It also provides the scientific and analytical basis for the comparative discussion of alternatives in Chapter II.

The assessment of environmental consequences helps the Forest evaluate each alternative in terms of its contribution to net public benefit, a measure of the overall value to the American public of a given alternative. Both priced benefits (commodities) and non-priced benefits (amenities) are considered in the determination of net public benefit.

Environmental consequences are described in terms of changes from the base year 1982 situation, unless otherwise stated under individual resource headings.

The severity of environmental consequences is limited because the only alternatives considered were those that ensure long-term productivity of the land. Forest-wide Standards and Guidelines addressing the various indicators of long-term productivity such as soil stability, wildlife population viability, vegetative diversity were developed early in the planning process and guided the development of alternatives. A detailed discussion of Forest-wide Standards and Guidelines is in Chapter IV of the Plan.

Environmental consequences are discussed for each resource. Each resource section describes the Forest activities that have major effects on that resource, how the consequences of these activities are assessed, the indicators used to assess the effects, the cause/effect relationships between the indicators and the resource, the assumptions important to the analysis (including possible mitigation measures), and consequences common to all alternatives. Consequences of activities that vary by alternative are discussed by alternative.

Fifty-year output projections were developed both by application of the linear programming model, FORPLAN, and by analysis outside of that model. The FORPLAN analysis is described in Chapter II and in Appendix B, with more detail in the planning records. Information about methods used to generate figures outside the model are contained in the planning records.

Chapter IV concludes with discussions of mitigation measures, unavoidable impacts, short-term impacts vs. long-term land productivity, irreversible and irretrievable commitments of resources, potential conflicts with other agency management plans, and energy requirements and conservation potential by alternative.

DIRECT, INDIRECT, AND CUMULATIVE ENVIRONMENTAL CONSEQUENCES

ECONOMIC ENVIRONMENT

Introduction

The Inyo National Forest contributes to the revenues of each of the seven counties containing National Forest System land through budget expenditures, Receipts Act payments, and Payments in Lieu of Tax (PILT) fees. The Forest also adds dollars to the economy of each county by attracting tourists to the area and generating jobs.

Although the seven-county area is not economically dependent upon the Forest, Forest management decisions have direct economic effects on ranchers, recreation permittees, and others who use National Forest System lands for their livelihood. Indirect impacts are found in the support of the economic infrastructure through special-use permits, recreation opportunities, landownership adjustments, energy and mineral activities, and utility line rights-of-way.

The economic consequences of implementing the alternatives can be described in various ways. A summary of key economic indicators is discussed in the following section. For a more comprehensive list of economic variables see Chapter II. Appendix B discusses in depth the factors and methodologies used in the economic analysis.

Indicators

1. Present Net Value (PNV)
2. Area employment and income
3. Receipts Act payments
4. Forest budget
5. Net cash flow.

Present Net Value is a measure of relative economic efficiency. PNV represents the difference between all priced benefits and all management costs. The projected costs and benefits for future decades are discounted to the 1982 base level because the discounting of values to a common base facilitates the comparison of benefits and costs that occur at different times. The Forest planning model (FORPLAN) allocated land uses and scheduled activities with the objective of maximizing the PNV of each alternative, subject to the set of objectives and requirements unique to the alternative.

The production of goods and services from the Inyo National Forest stimulates the local economy by generating income and employment. The results shown include both direct employment by the Forest and employment in the private sector induced by Forest activities.

Twenty-five percent of Forest-generated revenues to the federal treasury are returned to the counties to provide support for roads and schools.

The projected Forest budget represents Congressional appropriations for Forest management, plus cooperative dollars such as Green-sticker money from

the state to build OHV routes. Green sticker money is derived from the California Department of Motor Vehicles in lieu of license plate fees for OHV registration.

The difference between Forest-generated revenues to the federal treasury and the federal costs of managing the Forest is called net cash flow. Returns to the treasury are generated by market resources such as minerals, timber, grazing, and developed recreation and from special use permit fees.

Assumptions

1. The basic economic structure of the Forest's primary zone of influence (Inyo and Mono Counties) will not change substantially; the retail sales and service sectors will maintain their relative importance and their close tie to recreation and tourism.

2. The population of Southern California will continue to grow, and its pattern of recreational use will not change substantially.

3. The broad existing landownership patterns in the Eastern Sierra will be maintained.

CEE is the most cost-efficient alternative because only the minimum management requirements and minimum implementation requirements were applied as constraints on maximizing PNV. CEE is, therefore, the basis for comparison of PNV by alternative.

Table 62
Summary of Economic Indicators
for the Planning Period

	Alternatives					
Indicator	PRF	CUR	RPA	CEE	AMN	AMB
PNV (MM$)	3170.8	2559.3	3310.7	3484.1	2922.4	3084.1
Employment, first decade (M person years)	1.3	1.1	1.4	1.5	1.1	1.1
Receipts Acts Payments ($MM)	1.0	1.0	1.4	1.0	0.7	0.9
Total Forest Budget ($MM)	12.5	10.0	12.4	11.9	12.9	12.6
Net Cash Flow ($MM)	-9.4	-6.9	-7.8	-8.6	-11.0	-9.9

Consequences That Vary by Alternative

PRF: (Preferred) Increased developed and dispersed recreation programs support the relatively large PNV. Limitations on full ski area development and increased costs of timber harvest because of uneven-aged timber management west of U.S. 395 and no harvest in the San Joaquin area cause most of the loss in PNV as compared to CEE. However, non-priced benefits such as improved wildlife habitat, reduced impacts on mule deer, and improved visual quality offset the the reduced PNV in contributing to net public benefit.

This alternative requires an increase from current budget levels to provide increased recreation opportunities at standard levels and additional investments in range, wildlife, and watershed programs to provide a broad range of public benefits.

The diverse and increased Forest outputs of this alternative represent increased returns to the treasury, higher Receipts Act payments to the local counties, and increased employment and benefits to the local economy. Indicators show this alternative to be economically efficient; however, increased costs and the emphasis on both market and non-market outputs would result in the largest fifth-decade negative cash flow of any alternative.

CUR: (Current Program) PNV is lowest in this alternative, as are returns to the treasury, Receipts Acts payments to the counties, and total Forest budget. The employment indicator is second-lowest among the alternatives; it is not the lowest only because of the relative emphasis on employment-generating market resources. Budget limitations are directly responsible for the low PNV. The primary factors contributing to the low PNV are the limitations on capital investment for increased recreation development and maintenance of recreation facilities at low-standard levels, and the maintenance of a programmed timber below above the most cost-efficient level. Non-market resources such as dispersed recreation and wildlife are provided well below the level of projected public demand. The low budget and high relative emphasis on market outputs, however, provide this alternative with the smallest negative cash flow of all alternatives.

RPA: (1980 RPA Program) This alternative provides a broad range of resource outputs at high levels with an emphasis on market resources. The total Forest budget is highest for this alternative. Potential conflicts among resources are also high, as most resources are managed at high intensity on the maximum available acreage. The timber harvest schedule requires cutting in some existing concentrated recreation areas, key wildlife areas, and visually sensitive areas. Alpine ski area development occurs in conjunction with timber harvest, and both activities conflict with mule deer migration corridors. The loss of non-priced benefits, such as visual quality and recreation quality, would reduce the net public benefit under such an intensive management program. The PNV of this alternative is, however, second only to CEE. The reduction in PNV relative to the CEE alternative is associated with the increased cost of timber harvest, reduced developed recreation opportunities, and the lack of recommended wilderness. Receipts Act payments to local counties are highest in this alternative, due primarily to increased timber sales and developed recreation receipts. The emphasis on market outputs also increases employment in the local economy. While this

alternative ranks high in many economic variables, it does so at the expense of important amenity values and to the detriment of net public benefit.

CEE: (Maximize Cost-Efficiency) Economic efficiency is maximized in this alternative by scheduling timber harvest at economically efficient levels and maximizing the recreation program. This alternative has the second-lowest first decade total budget, yet equals the PRF total budget in the fifth decade because of the large recreation program and the cost of providing standard-level recreational services. Employment projections for the local economy are highest in this alternative. There is some question, however, of the ability of the Mammoth and June Lake communities to expand to support the full development of potential ski areas as proposed in this alternative.

Receipts Act payments are second to RPA because RPA emphasizes market outputs while CEE emphasizes both market outputs and non-market priced outputs such as wilderness, wildlife-related, and other dispersed recreation opportunities. Even with this emphasis, however, some timber harvest would occur within concentrated recreation areas and in sensitive wildlife habitat in the Monache area. The CEE alternative would provide payments to the local Counties comparable to PRF and would incur a negative net cash flow second only to PRF.

AMN: (Maximize All Amenities) Amenity and non-market resource benefits are emphasized in this alternative at the expense of market resources and economic efficiency. PNV is the lowest of any but the CUR alternative. Limited ski area expansion, reduced timber harvest and livestock grazing, and the large acreage recommended for wilderness or limited access management account for most of the reduction in PNV relative to CEE. The large first-decade total budget is needed to provide increased wilderness opportunities through capital investments in trails and trailhead facilities. The second-lowest fifth period total budget represents the relatively low cost of the developed-recreation and timber-harvest programs. Employment and Receipts Act payments to the counties are lowest of any alternative in the first decade. The negative net cash flow drops from the largest in the first decade to the third-smallest in the fifth decade, primarily due to the smaller total budget rather than large returns to the treasury. The losses in economic efficiency and local income resulting from this alternative would offset the gains in visual quality, wilderness acreage, primitive and semiprimitive recreation opportunities, and wildlife habitat quality.

AMB: (Emphasize Wildlife and Recreation) The amenity emphasis of this alternative is offset by increases in priced recreation outputs; although the timber and range programs are reduced, the PNV of this alternative ranks higher than that of AMN. Timber, range, and developed-recreation outputs are, however, restricted to levels below the most economically efficient level represented by CEE. Local employment indicates no significant increase in numbers. Receipts Act payments to counties are slightly lower than CUR in the first decade. As in AMN, a large first-decade total budget and a lower fifth-decade total budget are the primary factors that contribute to improving the negative net cash flow from the second-largest to second-smallest between the first and fifth decades. The lower fifth-decade budget represents a reduction in costly market resource programs in favor of amenity and non-market values.

SOCIAL ENVIRONMENT

Introduction

The six local social groups most likely to be affected by alternative outputs, land allocations, management practices, and special uses of the Inyo National Forest are identified as long-term residents, regional recreationists, seasonal employees, special-use permittees, American Indians, and retirees. Other sensitive groups such as women, the handicapped, the elderly, and minorities are distributed within the six identified groups. None of the alternatives will discriminate against any particular group.

The alternatives do raise social issues, however. When social groups within the Forest's primary zone of influence differ significantly in their needs and expectations for Forest resource use, there is potential for conflict. For example, alternatives that emphasize non-recreation market outputs (timber harvest, grazing, and mineral and energy development) are most acceptable to the long-time residents, Native Americans, and others whose livelihood is linked to those resources. On the other hand, alternatives that emphasize non-market outputs (dispersed recreation, wilderness, scenic quality, wildlife, and a natural environment) are most acceptable to the special-use permittees, regional recreationists, seasonal employees, and retirees who relate to the Forest primarily as a source of aesthetic values. Alternatives that emphasize developed recreation are generally acceptable to most of the identified groups.

Indicators

The consequences of alternatives will vary by group. Social attributes, such as lifestyle and quality of life, are the variables used to evaluate these consequences. These variables, though significant, are not in themselves quantifiable or measurable. Forest activities associated with each social variable are, therefore, used as indicators of the effects of each alternative on social variables.

The relationship of the social variables and the indicators of effects on those variables are displayed in Table 63. Tables 64 through 67 display the effects of the alternatives on social variables by social group.

Table 63
Social Variables and Indicators

Variables (Social Attributes)	Indicators (Forest Activities)
Lifestyle Patterns of work and leisure, customs and traditions; relationships with family, friends, and others	Timber harvest Livestock grazing Recreation development Mineral and energy uses Game animal management
Attitudes, Beliefs, and Values Feelings, preferences, and expectations that people have for the land and its uses	Air quality Water quality Visual quality Wilderness Wildlife habitat diversity Cultural resources
Community Stability and Cohesion The degree of cooperation between segments of the community in approaching problems or realizing shared goals and the lack of social conflict. Stability depends upon the rate of change with which people can cope.	Landownership adjustments Special use permits Interpretive services Personal safety Fire protection Recreation development
Population and Land Use The size, rate of change, and composition of the population and their effects on land use	Roads Water yield Special use permits Recreation development Landownership adjustments

Table 64
Summary of Alternative Effects on Social Groups for the Lifestyle Variable

	Alternatives					
Social Group	PRF	CUR	RPA	CEE	AMN	AMB
Longtime Resident	GC	GC	SC	GC	LC	GC
Regional Recreationist	GC	LC	GC	SC	LC	GC
Seasonal Employee	GC	LC	GC	SC	LC	GC
Special use Permittee	GC	LC	GC	SC	LC	GC
American Indian	GC	GC	GC	GC	LC	GC
Retiree	GC	GC	LC	GC	LC	GC

LC - Least coincides with group's lifestyle.
GC - Generally coincides with group's lifestyle.
SC - Substantially coincides with group's lifestyle.

Table 65
Summary of Alternative Effects on Social Groups for the Attitude, Beliefs and Values Variable

	Alternatives					
Social Group	PRF	CUR	RPA	CEE	AMN	AMB
Longtime Resident	GC	GC	SC	GC	LC	GC
Regional Recreationist	SC	LC	GC	SC	LC	GC
Seasonal Employee	SC	LC	GC	SC	LC	GC
Special use Permittee	SC	LC	GC	SC	LC	GC
American Indian	GC	GC	GC	GC	LC	GC
Retiree	SC	GC	GC	GC	LC	GC

LC - Least coincides with group's attitudes, beliefs, and values.
GC - Generally coincides with group's attitudes, beliefs, and values.
SC - Substantially coincides with group's attitudes, beliefs, and values.

Table 66
Summary of Alternative Effects on Social Groups
for the Community Stability* and Cohesion Variable

	Alternatives					
Social Group	PRF	CUR	RPA	CEE	AMN	AMB
Longtime Resident	S	S	S	S	LS	S
Regional Recreationist	N/A	N/A	N/A	N/A	N/A	N/A
Seasonal Employee	S	LS	S	LS	LS	S
Special use Permittee	S	LS	LS	LS	LS	S
American Indian	S	LS	S	S	LS	S
Retiree	S	S	S	LS	LS	S

LS - Alternative would be less stable and reduce community cohesiveness by creating polarization between the community and the group.
S - Alternative would create stability and cohesiveness between the group and the community.
NA - Not applicable to the group since it is not part of the community.

*Communities are most stable and cohesive under alternatives that continue the modest rate of growth currently found within the primary Forest zone of influence. Alternatives that retard community growth or stimulate an increased rate of growth are considered less stable. The Forest activity most likely to affect community growth is alpine ski area development in the Mammoth and June Lake areas.

Table 67
Summary of Alternative Effects on Social Groups for Population and Land Use Changes*

	Alternatives					
Social Group	**PRF**	**CUR**	**RPA**	**CEE**	**AMN**	**AMB**
Longtime Resident	S	S	S	S	LS	S
Regional Recreationist	N/A	N/A	N/A	N/A	N/A	N/A
Seasonal Employee	S	LS	LS	LS	LS	S
Special use Permittee	S	S	LS	LS	LS	S
American Indian	S	S	S	S	LS	S
Retiree	S	S	S	S	LS	S

LS - Alternative would create less stable population growth than recent trends.
S - Alternative would maintain stable and manageable population growth conditions based on recent trends.
NA - Not applicable to the group since it is not part of the community.

*Population growth which is lower than or considerably higher than recent historic levels represents less stable population growth. Increased population growth often entails increased land use needs and conflicting land uses.

Assumptions

Social variables and indicators are used to evaluate the potential impacts of the Forest alternatives on the six identified social groups. The relationships of social variables and indicators with social groups are based on assumptions about shared activities, interests, concerns, and values. The social groups are not necessarily mutually exclusive, as individual persons may belong to more than one group, may support variables uncharacteristic of the group, or may move from one group to another. General statements of potential impacts on social groups are therefore used only as a basis on which to compare the the alternatives. They are not intended to indicate potential impacts on individuals within those groups.

Likewise, although the Forest activities selected as indicators provide opportunities to predict, measure, and monitor the effects of alternatives, these indicators can affect several different social variables.
It is assumed that continued growth in recreation use and diversity of recreational opportunities is important both to groups who live in the area and those who visit.

It is assumed that any potential effects of the alternatives on American Indian cultural or religious sites would be adequately mitigated by the coordination requirements found in the Forest-wide Standards and Guidelines common to all alternatives.

Consequences That Vary by Alternative

PRF: (Preferred) This alternative would produce high-level recreation outputs while maintaining or increasing wilderness, wildlife habitat, and visual quality. These factors would maintain the lifestyle and the attitudes, beliefs and values of people associated economically with the natural resources such as longtime residents, seasonal employees, and American Indians. Maintaining or increasing market outputs may concern those who depend on the area for recreational, visual, and environmental quality values.

Regional recreationists, special use permittees, and retirees would be served by the open space, scenic values, solitude, and recreational opportunities represented by 172,600 acres of new wilderness, increases in fish and wildlife programs, and increases in facilities for skiing and developed recreation.

Community stability and cohesion and population growth would be maintained or increased. All social groups would be accommodated by controlled increases in recreational opportunities and the maintenance of alpine ski area potential. Population increases would continue at current or slightly accelerated rates acceptable to affected communities (based on community plans).

This alternative could support recent historic rates of population growth, primarily stimulated by increases in recreation use. There would be a shift of approximately 13,000 acres from a primary emphasis on timber production to other resource uses. American Indians would find increased employment associated with the recreational increases.

CUR: (Current Program) Although the current management program is generally supported by all social groups, budget limitations over five decades would prevent increases and allow for declining levels of fuelwood, grazing, fire protection, recreation, and wildlife habitat. For this reason, this alternative presents some serious potential effects. The recreation program is currently managed at low-standard levels, and no new construction of summer recreation facilities is occurring. This situation would be projected across the next fifty years. Consequently, recreation-related employment opportunities would be reduced after the first decade and continue to decline through the planning horizon. Regional recreationists, seasonal employees, and special use permittees would find diminished recreational opportunities, facilities, services, and employment.

Long-term residents and others linked economically to the use of natural resources would be served by the slight increases in timber outputs, the maintenance of near-current livestock grazing outputs, and the potential for substantial increases in mineral development.

The needs of social groups who use the Forest primarily for recreation would not be met (regional recreationists, special use permittees, seasonal employees, and retirees). With the severe limitations on summer recreation growth levied by budgetary restraints, facilities would be crowded, recreation seasons would be shortened, and recreational quality would suffer.

Community stability and cohesion in communities based on timber, livestock grazing, or mineral and energy production should be maintained since these Forest outputs would be maintained or increased.

Community stability and cohesion in recreation-dependent communities would be enhanced by moderate ski area development, but those benefits would be offset by the deterioration of the summer recreation program. Community stability and cohesion would be reduced as summer recreation demand is not met and tourism subsides.

Population growth and land use changes would be maintained at historic levels through the first period, but would be expected to slow as recreational opportunities declined in the lated decades. American Indians would find future losses in seasonal employment and reduced overall employment opportunity.

RPA: (1980 RPA Program) High market and non-market Forest outputs would accommodate the employment needs of long-time residents and other individuals associated economically with Forest outputs. Significant increases in market outputs, however, would generally conflict with those in all social groups whose lifestyle, beliefs, and values are linked to scenic quality, open space, and opportunities for solitude. This is true primarily because timber harvest would be conducted on the steeper, more visible slopes and in some concentrated recreation areas, and because there would be no new wilderness recommendations. Increased market outputs would come at great loss to scenic quality and diversity of amenity values.

The needs of long-term residents and others associated economically with natural resources would be met due to the high-level production of Forest commodities. In addition, most seasonal employees and regional recreationists would be served by increases in alpine skiing opportunities and developed summer recreation facilities. Most regional recreationists, special use permittees, seasonal employees, American Indians, and retirees would also be served because of increased opportunities. However, the increased intensity of management would sharply contrast with historic management and would detract from open space, scenic, and general environmental quality values.

There would be population increases, land-use changes, and increased land-use conflicts associated with the increased outputs. Community stability and cohesion would be weakened by changes in Forest policies. Population growth and rate of change could exceed the ability of the recreationally oriented communities to adapt. American Indians could benefit from better employment opportunities.

CEE: (Maximize Cost-Efficiency) This alternative has the highest developed and dispersed recreation outputs in response to projected demand. Regional recreationists, seasonal employees, special use permittees, and retirees

would find increased recreational diversity and employment opportunity. Resident trout populations would be maintained or increased slightly to support the increased demand for fishing, benefitting long-time residents, regional recreationists, and American Indians.

The large acreage of recommended wilderness (339,800 acres) would serve those who valued open space, unmodified scenery, and solitude. The increase in grazing and fuelwood production and the maintenance of moderate-level timber production would meet the needs of long-time residents, special use permittees, and American Indians.

This alternative would induce the largest development of alpine ski areas in response to projected demand. Because of population increases, the Mammoth and June Lake areas could grow at rates and numbers beyond the capability of the community to adapt. Community services, traffic routes, and water supplies could be inadequate to support the projected number of skier-days. Loss of community stability and cohesion would occur with the large immigration of people. Increases in population would also result in many land-use and landownership changes. Finally, the proposed reduction in the fire protection program would represent an increased threat to personal safety and property values on lands adjoining the National Forest.

AMN: (Maximize All Amenities) Reduced market and non-market outputs would necessitate changes in the lifestyle and reduce the sense of self-sufficiency of those linked economically with the natural resources or the recreation market. Increased fish and wildlife numbers would benefit some members of all social groups. However, because of lower timber and range outputs and minimal increases in recreation, this alternative would not meet the needs of many regional recreationists, seasonal employees, and special use permittees. Some long-time residents, American Indians, and retirees would be affected by the loss of resource outputs and recreational opportunity. Those who valued open space and solitude would be served by the large acreage in recommended wilderness and limited access management.

The de-emphasis on commodity production and on increased visitation to the area would serve the needs of retirees and regional recreationists for open space, air quality, unmodified scenery, and solitude. American Indian access to Forest lands for traditional uses could become more difficult because of large areas recommended for wilderness, and employment opportunities for Indians would decline. This alternative would reduce growth, with a shift in land use from timber, range, and recreation to limited access and non-consumptive use.

The outputs of this alternative would induce the least amount of community growth. There would be a loss of community stability and cohesion associated with a static growth economy. There would be reductions in the number of regional recreationists and seasonal employees, and there would be unemployment problems resulting from limitations on developed recreation opportunities. Less fuelwood would be available, but more high-quality wilderness, nature study, and primitive recreation opportunity would be provided by this alternative.

AMB: (Emphasize Wildlife and Recreation) The output levels of this alternative would maintain community stability and cohesion with little

conflict between consumptive and non-consumptive uses. This alternative allows for population growth to closely resemble historic rates, yet provides the needed increase in summer recreation outputs that CUR was unable to provide due to budget limitations. Land uses would shift away from traditional timber and range uses and toward an emphasis on wildlife, visual quality, wilderness, and recreational opportunities.

Long-time residents and American Indians would find limited employment opportunity with the lower levels of resource outputs. Self-sufficiency needs could be met through the slight increases in the fuelwood supply. The attitudes and beliefs of those who favor open space and solitude would be accommodated by the proposed wilderness recommendations and lands allocated to non-consumptive uses.

RESOURCE ENVIRONMENT

AIR QUALITY

Introduction

Forest activities that could result in long-term changes in air quality are community expansion associated with alpine ski area development, geothermal development, and mining activities. Forest activities that have localized and temporary effects on air quality are wildfire, prescribed burning, construction activities, and vehicle travel on unpaved roads.

Consequences of these activities on air quality are assessed in terms of visibility and concentration of pollutants, standards for which are specified by the Clean Air Act.

Indicators

1. Indicators of long-term changes

   Alpine ski area capacity
   Energy and mineral production.

2. Indicators of temporary and local changes

   Wildfire
   Prescribed burning
   Construction activities
   Unpaved roads.

Alpine ski area developments are closely associated with the resident and transient populations of neighboring communities. These communities grow in response to the amount of skiing available to attract recreation dollars. The larger the communities, especially those near ski areas (as they are in the colder areas of the Forest), the more fuelwood burning would occur and the more air quality would deteriorate due to increased particulate matter, increased noxious gases (CO_x), and reduced visibility. Likewise, increased populations would represent increased vehicle use with associated exhaust emissions (NO_x).

Geothermal energy production would result in gaseous emissions (primarily SO_x) and dust from facility and road construction and unsurfaced roads. Mineral extraction, construction activities, milling emissions, tailing disposal, and the use of unpaved roads could produce enough dust to impair visibility or to affect other Air Quality Related Values (AQRVs).

Smoke from wildfires increases particulate air pollution and affects visibility. The same is true of prescribed burning. However, wildfires may occur during periods of poor air quality, while prescribed burning is conducted only under conditions favorable for minimizing air quality impacts. In addition, prescribed burning would have effects lasting one or two days at most; the duration of a wildfire could well be longer. On the other hand, as prescribed fires burn at low intensity, they result in more smoke from incomplete combustion than many higher-intensity wildfires.

Dust from construction and use of unpaved roads also impairs visibility.

Assumptions

The only substantial changes in air quality will be the long-term changes associated with community growth and geothermal/mineral development. The amount of air quality deterioration from community growth will be proportional to ski area capacity. The effects of mineral and energy development will be proportional to new acres disturbed for those activities.

A smoke management plan will be developed with each Fire Management Action Plan and prescribed burning plan to maximize smoke dispersion and minimize visibility deterioration.

Power plant and milling operations are regulated by the Air Resources Board; the application of Best Available Control Techniques (BACT) ensures compliance with ambient air standards most of the time.

Forest activities will be managed to meet state and federal air quality standards in all alternatives.

AQRVs will be developed for areas (such as Class I wilderness) that are especially sensitive to air quality deterioration. Air quality in such areas will be monitored whenever Forest activities or environmental conditions pose a threat to AQRVs.

Although vehicular emissions are generally a major source of pollutants, the number of vehicles utilizing the Forest road system (outside of communities) at any one time will be too small to measurably lower air quality.
Particulate matter generated by mineral and geothermal activities will vary by season of use and geographic location. Although local impacts could be generated, AQRVs are not expected to be severely affected, either by individual impacts or cumulative ones.

Consequences Common to All Alternatives

Although total acres of wildfire and prescribed burning vary by alternative, the net effects of these activities do not. The intermountain air basin has excellent dispersion during the fire season, and smoke management plans for

fire suppression and prescribed burning will minimize the effects of these activities on AQRVs.

Water mining (groundwater pumping) and water regulation, including diversions, are activities outside Forest Service control that impact air quality in both Class I and Class II areas on the Forest. The impacts of these activities arise when lake levels and/or water tables drop. Exposed lakebeds and soil that are losing vegetation due to lack of groundwater are major sources of airborne dust in the Owens and Mono Basins. The degradation of AQRVs from these activities peaks during the late winter, early spring, and fall seasons. The problem is currently under litigation, and the Forest is working with the local Air Resources Board to work toward a resolution.

Traffic on unpaved roads generates localized and temporary dust problems. The excellent dispersion qualities of the intermountain region and the small number of vehicles using Forest roads work together to keep impacts on AQRVs below measurable levels.

Geothermal development under current leasing agreements could amount to approximately six power plants on 300 acres in Lease Blocks I and II under all alternatives.

Consequences that Vary by Alternative

The following figure is helpful in understanding the effects of alternatives on air quality.

Table 68
Indicators of Projected Impacts on Air Quality
(end of the fifth decade)

	Alternatives					
Indicator	**PRF**	**CUR**	**RPA**	**CET**	**AMN**	**AMB**
New geothermal and mineral development (M acres disturbed)	6.1	6.1	7.0	3.9	3.1	4.8

PRF: (Preferred) and CUR: (Current Program). Any air quality deterioration will include increased levels of CO_x, NO_x, and particulate matter. The community of June Lake, which may be nearing the upper limits of ambient air standards for CO_x a few days a year, will experience the impacts of increased ski area capacity.

Mineral opportunities will be relatively high under these alternatives; projected air quality deterioration from mineral activities will also be high.

RPA: (1980 RPA Program) Projected air quality deterioration from mineral activities will also be the highest.

CEE: (Maximize Cost-Efficiency) Mineral opportunities will be moderate under this alternative. Projected air quality deterioration from mineral activities will also be moderate.

AMN: (Maximize All Amenities) Mineral opportunities will be lowest under this alternative. Projected air quality deterioration from mineral activities will also be low.

AMB: (Emphasize Wildlife and Recreation) Mineral opportunities will be moderate under this alternative. Projected air quality deterioration from mineral activities will also be moderate.

CULTURAL RESOURCES

Introduction

Forest activities that have effects on cultural resources include those which cause ground disturbance, change the amount or intensity of visitor use or grazing pressure, affect vehicle access, or otherwise result (directly or indirectly) in changing the physical character of a particular piece of land.

Consequences of these activities are assessed in terms of the relative potential threat to cultural values posed by each alternative. Data sources used for this analysis include Forest planning documents, previous environmental analyses (Forest Service and other), and professional judgment and past experience.

Indicators

1. Direct Indicators of Disturbance

   This indicator is determined from the total number of new acres disturbed by private and public developed summer recreation sites, alpine ski areas, roads (excluding mining roads), trails (excluding nordic trails), acres under high-level timber management, acres disturbed by geothermal and other mineral activities (including roads), and lands to be exchanged out of federal ownership over the next fifty years.

2. Indirect Indicators of Disturbance

   Summer recreation use
   Domestic livestock grazing.

3. Beneficial Impact Indicators

   Recommended wilderness
   Cultural resource program direction.

Ground-disturbing actions have the potential to destroy or adversely impact cultural resource properties. The greater the total area disturbed, the

greater the likelihood of sites being impacted. The acreage disturbed by new roads is calculated as a corridor one-half mile wide. Trails are calculated as a corridor one-quarter mile wide.

Recreation use (RVDs and WFUDs) and grazing (AUMs) represent a gross relative measure of the potential impacts on cultural resources resulting from increasing visitor use and grazing activities. Both types of use can affect cultural values by ground disturbance. Recreation use is also an indicator of artifact hunting and vandalism.

The larger the acreage in wilderness, the less likely it is that cultural values on those acres will be adversely impacted. The type and amount of use in wilderness is restricted, resulting a low density of visitation, prohibition of vehicle entry, and lack of ground-disturbing resource management.

Cumulative long-term impacts on cultural values can be mitigated not only by coordination with other resource management and Forest activities, but also by a formal program of monitoring, protection (other than project-related), enhancement, and interpretation. The degree to which these activities are implemented varies with the cultural resource program direction for each alternative. This variation is discussed by alternative in the narratives below.

Assumptions

There is not necessarily a one-to-one correspondence between the number of acres disturbed and the number of cultural resource sites potentially impacted. The density of cultural sites varies from one geographic location to another, and certain types of activities can be mitigated better than others. Due to this variation, the presence of cultural values does not necessarily imply a reduction in the land base available for resource management. Although there could be an impact on the acreage available for timber harvest, that impact will be mitigated by pending Memoranda of Agreement between the Forest and the California Office of Historic Preservation. Under these memoranda, piagi (Pandora moth larva) collection sites have been protected from timber harvest by implementing over-the-snow logging techniques. This type-of-site, type-of-undertaking approach has been studied for the past five years. Its success allows timber harvest to occur in areas not previously available for entry.

Recreation impacts are disproportionately distributed over the Forest, based on the differing density of use on different types of land. For example, recreation use averages 18.1 visitor days per acre in concentrated recreation areas, whereas it averages only .042 visitor days per acre on unroaded lands.

The adverse impacts resulting from trail construction and visitor use in wilderness are covered by the indicators for direct disturbance and recreation use.

Cultural resources are protected under all alternatives by the mandatory compliance requirements contained in 36 CFR 800 and the provisions of the Memorandum of Understanding (dated February, 1977), between the Forest Service and the Advisory Council on Historic Preservation. Implementation of

specific projects requires the preparation of individual environmental documents. These documents include formal consultation (as required by 36 CFR 800 and the Forest-wide Standards and Guidelines).

Consequences Common to All Alternatives

Regardless of the alternative chosen, there will be a number of cumulative long-term impacts on cultural resources. Cultural resource management currently has a negligible effect on other resources. However, the density of sites per acre is substantially higher on the Inyo than on many other Forests in the Region (one site per 59 acres as compared with one per 105 acres on the Angeles and one per 245 acres on the Tahoe National Forest). Given this situation, the long-term utility of mitigating direct impacts through avoidance of impacts will decline. In addition, site-by-site and project-by-project evaluation and mitigation will become less viable over time as they are labor-intensive and geared to short-term expediency. However, they will become more important as the ability to avoid impacts decreases. These considerations underline the need to emphasize studies directed to type-of-site and type-of-project compliance and management, and to increase the role played by those approaches.

Consequences that Vary by Alternative

Table 69 displays the effects of alternatives on cultural resources.

Table 69
Indicators of Effects on Cultural Resources
(by the end of the fifth decade)

	Alternatives					
Indicator	PRF	CUR	RPA	CEE	AMN	AMB
Direct Disturbance Indicator						
M acres direct ground disturbance (total)	195.1	227.5	366.6	326.2	149.7	188.6
Relative potential threat*	L	L	H	H	L	L
Indirect Disturbance Indicators						
MM RVDs & WFUDs (5th decade)	6.6	4.6	6.5	6.6	5.0	6.2
Relative potential threat*	H	L	H	H	L	H
M annual AUMs (5th decade)	41.4	39.1	55.6	46.5	35.1	39.4
Relative potential threat*	M	L	H	M	L	L
Beneficial Impact Indicator						
M acres recommended wilderness	172.6	107.6	0	339.8	510.8	222.7
Relative potential threat*	H	H	H	M	L	M
CUMULATIVE RELATIVE THREAT**	M	L	H	H	L	M

* Assigned values correspond to the lower (L), middle (M), and upper (H) thirds of the total range of variation.

** Cumulative relative threat was determined by assigning point values to relative potential threats (L = 1, M = 2, H = 3), summing total points by alternative, and determining corresponding placement in lower, middle, and upper third of the total range of variation.

PRF: (Preferred) Under this alternative, disturbed acres and summer recreation will increase 24 percent and 74 percent respectively as compared with 1982. Wilderness acreage will increase 31 percent. The relative potential threat to cultural values under this alternative will be moderate.

The direction for cultural resources under this alternative includes completing the Forest-wide, emphasizing type-of-site and type-of-project methods for completing project evaluation and mitigation work, and developing a balanced program of inventory, evaluation, protection, enhancement, and interpretation. This direction will offset the potential threat to cultural resources under the alternative.

CUR: (Current Program) Under this alternative, there will be an increase in disturbed acres and summer recreation use of 29 percent and 21 percent respectively. Livestock grazing will decline 6 percent. Wilderness acreage

will increase 19 percent. The relative potential threat to cultural values under this alternative will be low.

Under this alternative, cultural resources will be inventoried at the rate of approximately 12,000 acres per year, primarily in preparation for timber sales and other undertakings with potential to affect cultural values. Mandatory historic preservation requirements for project implementation will be met primarily through the avoidance of impacts. Recorded sites are evaluated; formal site testing and mitigation are undertaken only when impact avoidance is not feasible. Type-of-site evaluation studies are developed and implemented as the opportunity arises. There is a minimum of formal non-project site protection, interpretation, and enhancement. This direction will do little to offset the potential threat to cultural resources under this alternative.

RPA: (1980 RPA Program) Selection of this alternative will result in a 47 percent increase in direct ground disturbance, a 71 percent increase in summer recreation use, and a 34 percent increase in grazing. Wilderness acres will be the same as in 1982. The relative potential threat to cultural values under this alternative will be the highest of any alternative.

In response to RPA goals, the cultural resources program direction for this alternative requires the completion of a Forest-wide inventory by the year 1995, representing an average of 180,000 project and non-project acres per year. Additional cultural resource direction calls for supplementing a primary mitigation strategy of impact avoidance with type-of-site and type-of-project evaluations, initiating a formal site monitoring and protection program, and pursuing enhancement and interpretation activities as the opportunities arise. This direction will somewhat offset the potential threat to cultural resources under this alternative.

CEE: (Maximize Cost-Efficiency) Under this alternative, there will be a 42 percent, 76 percent, and 12 percent increase in disturbed acres, summer recreation use, and livestock grazing respectively. Wilderness acreage will increase 60 percent. The overall potential threat to cultural values will be high, second only to RPA.

Cultural resource program direction for this alternative includes conducting an average of 12,000 acres per year of project-related and non-project surveys; developing a balanced evaluation and mitigation program involving the avoidance of impacts, type-of-site and type-of-project approaches; and developing the formal monitoring, protection, enhancement, and interpretation aspects of the program. This direction will slightly offset the increased threat to cultural resources.

AMN: (Maximize All Amenities) Under this alternative, there will be a 19 percent increase in disturbed ground, a 32 percent increase in summer recreation use, and a 15 percent reduction in AUMs. Wilderness acres will increase 90 percent. The relative potential threat under this alternative will be the lowest of any alternative.

Under this alternative a formal non-project initiated survey program will be developed, resulting in an average of 45,000 acres per year of inventory, including project-related work. Evaluation and mitigation will be pursued

through a balanced program of impact avoidance, type-of-site, and type-of-project approaches; formal non-project site protection and monitoring efforts will be implemented. Enhancement and interpretive activities will be developed as opportunities arose. This direction will further reduce the low level of threat to cultural resources.

AMB: (Emphasize Wildlife and Recreation) This alternative will result in a 24 percent increase in disturbed acres, a 63 percent increase in summer recreation use, and a 5 percent reduction in livestock grazing. Wilderness acreage will increase 39 percent. The overall potential threat to cultural values will be low.

The specifics of the cultural resources direction for this alternative include the examination of 45,000 average annual acres of project and non-project inventory; an evaluation and mitigation program based on a balance of impact avoidance and type-of-site, type-of-project approaches; formal site protection and monitoring endeavors; and a special emphasis on cultural resource enhancement and interpretation. This direction will further reduce the low level of threat to cultural resources.

DIVERSITY

Introduction

Forest activities that have major effects on the diversity of vegetative seral stages include timber harvest, fire management, range management, wildlife habitat management, recreation management, and special designations such as wilderness, Research Natural Areas, and Special Interest Areas.

Consequences of these activities are assessed in terms of the amount and distribution of vegetation in different successional stages. Data sources for this analysis include studies of species and vegetation types, forest management principles, management experience, and field observations.

Effects on cliffs, caves, and rock outcrops are subject to minerals management and recreation. These elements are not tracked by alternative since impacts are hard to quantify. In general, however, alternatives with the least potential for land disturbance and the lowest levels of recreation use will least affect these elements.

Certain key diversity elements are addressed under other headings. Snags are discussed under wildlife. Streams are discussed under fish. Riparian areas have their own heading.

Indicators

1. Size of the commercial timber base

2. New ski areas

3. Existing old growth in suitable timber

4. Wildfire

5. Brush rejuvenation for range and wildlife

6. Brush subject to decadence

7. Watershed improvement (wet meadow protection)

8. Wet meadows subject to accelerated erosion

9. Special designations (wilderness, RNAs, SIAs).

The amount of existing old growth timber retained in each alternative will be related to the size of the commercial timber base and to the acreage developed for new ski areas. Both commercial timber management and ski area development entail the cutting of trees. In the case of timber management, maximum wood production retains forest lands in earlier seral stages. In the case of ski areas, harvested areas remain free of trees altogether. "Old growth" on the Inyo National Forest refers to trees more than 140 years old, with a diameter-at-breast-height (dbh) of approximately 28 inches. The Forest currently has 199,275 acres of timber that meet this criterion. 53,951 acres of that total are on lands capable of commercial timber production and not withdrawn for other reasons suitable timber lands.(the tentatively suitable timber base). Most of the remaining acres are in existing wilderness.

The amount of brush subject to maturation is inversely proportional to the amount of vegetation treatment and the amount of wildfire in that vegetation type. Vegetation treatment and wildfire both can have a rejuvenating effect, as they remove older, mature vegetation and stimulate vigorous new growth. Brush becomes mature after approximately 80 years. Currently the Forest has 679,000 acres of brush, of which approximately 136,000 acres is already mature. Without treatment, most of the remaining acres will be mature in 20 to 50 years. Approximately 6,800 acres will need rejuvenation annually to maintain a maximum of 20 percent in the oldest seral stage.

Large-scale brush vegetation treatments are not currently recommended on the Inyo. Prescribed burns and wildfire have had inconsistent results. The success of a project is dependent on the pre-burn vegetation conditions and climatic conditions following the burn.

Vegetation communities that have perennial herbaceous understories tend to respond favorably to vegetation treatments that remove the shrub overstory. Communities that have sparse perennial herbaceous understories do not, and are usually invaded by undesirable shrub or annual exotics. Areas that will be subject to treatment are existing stands that have well-developed understories of perennial herbaceous vegetation.

The amount of wet meadow subject to accelerated erosion is inversely proportional to watershed improvement work in wet meadows. Watershed improvement entails the protection of eroding soils by structural and vegetative armoring and the restoration of damaged soils with techniques that enable sediment to fill in scars from past erosion. There are approximately 26,000 acres of wet meadow on the Forest. Of these, approximately 23,500 acres (most of that in the Golden Trout Wilderness) have been identified for watershed improvement.

Areas with special designations favor older seral stages of timber and brush, as active vegetation management is not conducted in such areas.

Assumptions

All alternatives include direction to meet minimum management requirements for diversity on a Forest-wide basis.

Consequences Common to All Alternatives

The 400,100 acres of pinyon-juniper on the Forest will be affected very little by management activities in any alternative.

Despite vegetation treatment and wildfire, the amount of brush on the Forest is so large that most will be decadent by the end of the fifth decade under any alternative.

The 145,324 acres of identified old-growth coniferous forest in wilderness and RNAs will follow natural ecological processes under all alternatives. The 53,951 acres of old growth in the tentatively suitable timber base will be subject to a shift toward earlier seral stages due to timber management and/or ski area development (the amount varies by alternative).

Consequences that Vary by Alternative

The following figure is helpful in understanding the effects of alternatives on vegetative seral stage diversity.

Table 70
Indicators of Effects on Seral Stage Diversity
(by the end of the fifth decade)

	Alternatives					
Indicator	PRF	CUR	RPA	CEE	AMN	AMB
Commercial timber base (M acres)	75.2	89.1	99.2	97.6	61.8	69.8
Existing old growth in suitable timber (M acres)	33.0	5.0	4.2	7.6	33.2	22.1
Brush rejuvenation (M acres)	11.4	85.6	118.5	116.6	111.3	109.0
Wildfire (M acres)	53.2	52.9	53.2	64.5	48.2	51.4
Decadent brush (M acres)	615	541	508	498	519	519
Wet meadow treatment (M acres)	23.5	2.0	9.9	23.5	23.5	23.5
Wet meadow subject to accelerated erosion (M acres)	0	93.0	13.6	0	0	0
Wilderness/RNAs/SIAs (M acres)	864.4	769.2	661.6	982.1	1149.8	903.4

PRF: (Preferred) Shrubby vegetation will continue to mature and overall diversity to decline with the shift toward older seral stages, despite the effects of vegetation treatment and wildfire. Of total acreage in brush types, 75 percent will reach the oldest seral stage within five decades.

Suitable timber lands will shift toward earlier successional stages and greater diversity due to timber management.

CUR: (Current Program) Shrubby vegetation will continue to mature and overall diversity to decline with the shift toward older seral stages, despite the effects of vegetation treatment and wildfire. Of total acreage in brush types, 80 percent will reach the oldest seral stage within five decades.

Suitable timber lands will shift toward earlier successional stages and greater diversity due to timber management. A small amount of wet meadow improvement will have occurred, leaving 93 percent of meadow acres vulnerable to accelerated erosion.

RPA: (1980 RPA Program) Shrubby vegetation will continue to mature and overall diversity to decline with the shift toward older seral stages, despite the effects of vegetation treatment and wildfire. Of total acreage in brush types, 74 percent will reach the oldest seral stage within five decades.

Suitable timber lands will shift toward earlier successional stages and greater diversity due to timber management. A moderate to low level of wet meadow improvement will have occurred, leaving 60 percent of meadow acres vulnerable to accelerated erosion.

CEE: (Maximize Cost-Efficiency) Shrubby vegetation will continue to mature and overall diversity to decline with the shift toward older seral stages, despite the effects of vegetation treatment and wildfire. Of total acreage in brush types, 73 percent will reach the oldest seral stage within five decades.

Suitable timber lands will shift toward earlier successional stages and greater diversity due to timber management. The full program of wet meadow improvement will have occurred, leaving none vulnerable to accelerated erosion.

AMN: (Maximize all Amenities) Shrubby vegetation will continue to mature and overall diversity to decline with the shift toward older seral stages, despite the effects of vegetation treatment and wildfire. Of total acreage in brush types, 76 percent will reach the oldest seral stage within five decades.

Suitable timber lands will shift toward earlier successional stages and greater diversity due to timber management. The amount of existing old growth in suitable timber will have declined 38 percent since 1982 due to timber management. The greatest impacts on old growth will be found in Jeffrey pine, due to the large acreage managed.

The full program of wet meadow improvement will have occurred, leaving none vulnerable to accelerated erosion.

AMB: (Emphasize Wildlife and Recreation) Shrubby vegetation will continue to mature and overall diversity to decline with the shift toward older seral stages, despite the effects of vegetation treatment and wildfire. Of total acreage in brush types, 76 percent will reach the oldest seral stage within five decades.

Suitable timber lands will shift toward earlier successional stages and greater diversity due to timber management. The full program of wet meadow improvement will have occurred, leaving none vulnerable to accelerated erosion.

ENERGY

Introduction

The potential energy sources addressed under this heading are hydroelectric development and wind power development; geothermal energy development is discussed under the heading of Minerals. Forest activities that could affect opportunities for energy development are recreation management, visual resource management, fish habitat management, riparian area management, watershed management, and wilderness recommendations.

Indicators

1. Management direction

2. Wilderness recommendations.

Management direction can encourage and/or restrict energy development, affecting the opportunities for such development. Management direction is found in the Forest-wide Standards and Guidelines common to all alternatives, Management Prescription direction, and resource program direction unique to each alternative.

Wilderness recommendations have the potential to affect energy development opportunities, as new energy projects will not be considered inside wilderness.

Assumptions

The Forest-wide Standards and Guidelines common to all alternatives contain the management direction most likely to affect energy development. Standards and Guidelines for energy development encourage such development to the degree commensurate with other resource values, and they direct the Forest to consider energy proposals on a case-by-case basis. Key Standards and Guidelines for other resources (such as fish, water quality, soils, and visual quality) define the maximum acceptable impact levels for those resource values. Management Prescription direction and resource program direction unique to each alternative rarely apply more stringent standards to

those lands with identified energy potential than the Forest-wide Standards and Guidelines.

Wilderness recommendations will have little effect on energy potential. Only three hydroelectric proposals (out of a total of 36) lie within Further Planning Areas, and all three lie close enough to the Further Planning area boundary to be easily excluded by a boundary adjustment before wilderness designation if such exclusion were desirable. The only wind-power proposal received by the Forest addresses lands outside wilderness. Although there have been no additional proposals, potential has been suggested for the White Mountains. Even under the alternative with the largest wilderness recommendation, considerable high-elevation acreage in the White Mountains will remain outside wilderness.

Consequences Common to All Alternatives

Due to the assumptions discussed above, opportunities for new hydroelectric and wind power development are considered common to all alternatives.

FACILITIES

Introduction

Environmental consequences on facilities are discussed primarily in terms of roads and trails. Forest activities that affect Forest road and trail construction include timber management, recreation management, and wilderness recommendations. Consequences on other types of facilities are minor and will not vary from one alternative to another.

Indicators

1. Miles of new road
2. Miles of new trail
3. Maintenance level.

Forest roads provide access to the public for recreational use and for wood gathering. They also provide access for such Forest Service management activities as timber harvest, recreation development, fire suppression, and range administration.

Existing trails serve primarily to provide hiker/equestrian access to wilderness and other unroaded areas. Potential trails include minor additions in existing wilderness and improved access for recommended wilderness. There is an increased emphasis on non-wilderness trails to better distribute use and protect resources in concentrated recreation areas, to attract day use away from overcrowded wilderness trails, to expand on existing opportunities for nordic skiing and OHV use, and to initiate opportunities for cyclists and the handicapped. In addition to new trail construction, certain key user-maintained trails in recommended wilderness will be added to the Forest trail system, improved to meet standards, and assigned an appropriate maintenance level.

Forest roads and trails are assigned maintenance levels based on Road Management Objectives and the amount of use they receive. If assigned maintenance levels are not met, the road and trail network deteriorates, safety hazards arise, and carrying capacity declines.

Assumptions

Although roads constructed for mineral and geothermal activities will affect overall access to some degree, they are not included in this discussion. Mineral and energy roads are developed by private parties in response to specific mineral or energy opportunities. Consequently, their locations cannot be predicted and public use of the roads may be discouraged or prohibited.

Geothermal developers are required to maintain roads to existing standards within their lease areas. The use of roads by all mineral developers outside of their lease areas or claims requires a Special Use Permit which will contain language specifying road maintenance activities.

Consequences Common to All Alternatives

The need for a visitor center to serve the Mono Basin National Forest Scenic Area was identified in the legislation establishing that area. That site will be constructed under all alternatives.

Other facilities include airstrips and heliports, borrow and disposal sites, and dams. There are no major issues or concerns related to these facilities, nor are they expected to change from one alternative to another.

Thirteen miles of new trail will be constructed in existing wilderness under all alternatives.

Roads and trails will be reconstructed on a regular basis (approximately once every twenty years) under all alternatives.

There will be negligible local road construction under any alternative, as most logging on the Forest uses over-snow skidding methods and because a network of primitive vehicle routes already permeates most suitable timber lands.

Consequences that Vary by Alternative

Table 71 displays the effects of the alternatives on roads and trails by the end of the fifth decade.

Table 71
Indicators of Effects on Road and Trail Systems
(total miles - end of the fifth decade)

Indicators	Alternatives					
	PRF	CUR	RPA	CEE	AMN	AMB
New Road Construction						
-timber	0	6	21	21	0	0
-developed recreation	87	40	82	44	14	38
-Total	**87**	**46**	**103**	**65**	**14**	**38**
New Trail Construction						
-existing wilderness	13	13	13	13	13	13
-recommended wilderness	36	15	0	60	66	56
-concentrated rec. area	180	0	180	180	80	120
-open National Forest	20	0	20	20	20	20
-OHV	36	0	50	52	0	0
-nordic	350	150	275	400	250	300
-Total	**635**	**178**	**538**	**725**	**429**	**509**
Roads and trails maintained to assigned levels	yes	no	yes	yes	yes	yes

PRF: (Preferred) *A total of 87 miles of new Forest roads will be* constructed under this alternative. These will be built to provide for recreation site access. Most of the new road will be found in existing concentrated recreation areas, but some new sites will be developed outside those areas as well.

There will be 635 miles of new trails created for a variety of uses. Most trails will be constructed over the first two decades. There will be 36 miles of trail in recommended wilderness to provide for appropriate access while emphasizing the retention of each area's unique wilderness qualities. In addition to new trails, existing trails in recommended wilderness will be added to the Forest trail system and will receive regular maintenance. The 180 miles of trail in concentrated recreation areas and 20 miles in other areas of the Forest will serve primarily to disperse day users, protect resources, especially in riparian areas, to provide opportunities for cyclists and the handicapped, and to attract day use away from overcrowded wilderness trails. Nordic ski trails will triple, and OHV trails will increase moderately in response to increasing demand.

The condition of roads and trails will be excellent, as all facilities will be maintained to assigned maintenance levels.

CUR: (Current Program) A total of 21 miles of new Forest roads will be constructed under this alternative to facilitate timber management in the San Joaquin and Monache areas in the first two decades. Those roads will improve access to lands previously accessible only on foot or by four-wheel drive vehicle, changing the type and amount of use considerably. There will be no new developed recreation site access roads.

There will be 178 miles of new trails created for a variety of uses. Most new trails will be constructed over the first two decades. The 15 miles of traila in recommended wilderness will be located in the White Mountains, as that is the Further Planning Area with the greatest opportunities. The total trail mileage will be limited by budget restrictions in this alternative. In addition to new trails, existing trails in recommended wilderness will be added to the Forest trail system. There will be no new trails in concentrated recreation areas or in open National Forest to disperse day users, protect resources, provide opportunities for cyclists or the handicapped, or attract day use away from overcrowded wilderness trails. Nordic ski trails developed by the private sector under permit will nearly double in response to increasing demand. There will be no new OHV trails.

Roads and trails will not be maintained to assigned maintenance levels, as this alternative has budget limitations. Overall condition will decline, carrying capacity will drop, and safety problems will arise.

RPA: (1980 RPA Program) A total of 103 miles of new Forest roads will be constructed under this alternative. Timber management will require a total of 21 miles of new road in the San Joaquin and Monache areas in the first two decades. Those roads will improve access to lands previously accessible only on foot or by four-wheel drive vehicle, changing the type and amount of use considerably. New developed recreation site access will account for 82 miles of road. Most of the new roads will be found in existing concentrated recreation areas, but new sites will be developed outside those areas as well.

There will be 538 miles of new trail created for a variety of uses; most new trails will be constructed over the first two decades. The 180 miles of trail in concentrated recreation areas and 20 miles in other areas of the Forest will serve primarily to disperse day users, protect resources, especially in riparian areas, to provide opportunities for cyclists and the handicapped, and to attract day use away from overcrowded wilderness trails. Nordic ski trails will increase 150 percent and OHV trails will increase substantially in response to increasing demand.

The condition of roads and trails will be excellent, as all facilities will be maintained to assigned maintenance levels.

CEE: (Maximize Cost-Efficiency) A total of 65 miles of new Forest roads will be constructed under this alternative. Timber management will require a total of 21 miles of new road in the San Joaquin and Monache areas in the first two decades. Those roads will improve access to lands previously accessible only on foot or by four-wheel drive vehicle, changing the type and amount of use considerably. New developed recreation site access will

account for 44 miles of road; most of the new road will be found in existing concentrated recreation areas, but new sites will be developed outside those areas as well.

There will be 725 miles of new trail created for a variety of uses. Most trails will be constructed over the first two decades. The 60 miles of trails in recommended wilderness will mostly be located in the White Mountains and Coyote areas, as those are the Further Planning Areas with the greatest opportunities. In addition to new trails, existing trails in recommended wilderness will be added to the Forest trail system and will receive regular maintenance.

The 180 miles of trails in concentrated recreation areas and 20 miles in open National Forest will serve primarily to disperse day users, protect resources (especially in riparian areas), to provide opportunities for cyclists and the handicapped, and to attract day use away from overcrowded wilderness trails. Nordic ski trails will more than triple and OHV trails will increase substantially in response to increasing demand.

The condition of roads and trails will be excellent, as all facilities will be maintained to assigned maintenance levels.

AMN: (Maximize All Amenities) As only fourteen miles of new Forest recreation roads will be constructed under this alternative, vehicle access will be little changed from 1982.

There will be 379 miles of new trails created for a variety of uses. Most trails will be constructed over the first two decades. The 66 miles of trail in recommended wilderness will mostly be located in the White Mountains and Coyote areas, as these are the Further Planning Areas with the greatest opportunities. In addition to new trails, existing trails in recommended wilderness will be added to the Forest trail system and will receive regular maintenance. The 80 miles of trails in concentrated recreation areas and 20 miles in open National Forest will serve primarily to disperse day users, protect resources (especially in riparian areas), to provide opportunities for cyclists and the handicapped, and to attract day use away from overcrowded wilderness trails. Nordic ski trails will increase substantially in response to increasing demand for that use; there will be no new OHV trails.

Roads and trails will be in excellent condition. All facilities will be maintained to assigned maintenance levels, as this alternative has no budget limitations.

AMB: (Emphasize Wildlife and Recreation) A total of 38 miles of new Forest roads will be constructed under this alternative for new developed recreation site access. All of the new road will be found in existing concentrated recreation areas.

There will be 509 miles of new trails created for a variety of uses. Most new trails will be constructed over the first two decades. The 56 miles of trails in recommended wilderness will mostly be located in the White

Mountains and Coyote areas, as those are the Further Planning Areas with the greatest opportunities. In addition to new trails, existing trails in recommended wilderness will be added to the Forest trail system and will receive regular maintenance. The 120 miles of trails in concentrated recreation areas and 20 miles in other Forest areas will serve primarily to disperse day users, protect resources (especially in riparian areas), to provide opportunities for cyclists and the handicapped, and to attract day use away from overcrowded wilderness trails. Nordic ski trails will increase 171 percent in response to the increasing demand for that use; there WILL be no new OHV trails.

Roads and trails will be in excellent condition; all facilities will be maintained to assigned maintenance levels.

FISH

Introduction

Forest activities that have major effects on fish habitat include fish habitat management, watershed management, energy development, community development, summer recreation use, and range management.

Consequences of these activities are assessed in terms of resident fish habitat capability and consequent changes in fish production (number and size of fish). Data sources for this analysis include streambank stability surveys, fish habitat management principles, research, management literature, habitat capability models for selected indicator species, and professional judgment and experience. Habitat capability models were used to assess species response to management practices. Various resident trout (rainbow, brook, brown, and golden trout) were selected as indicator species for monitoring changes in fish habitat; the most sensitive species in a given stream will be the indicator for that stream.

Indicators

1. Fish habitat improvement
   - Threatened trout habitat
   - Golden Trout Wilderness habitat
   - Concentrated recreation areas
   - Rewatering of dewatered streams

2. Watershed improvement work in wet meadows

3. Domestic livestock grazing

4. Energy development (hydroelectric and geothermal)

5. Community growth (using alpine ski area capacity is an indicator)

6. Developed summer recreation use.

The effect of each alternative on fish habitat capability depends primarily on the amount of fish habitat improvement in streams. Fish habitat

improvement includes the removal of stream barriers, structural improvements (such as weirs and check dams), and the removal of undesirable fish (in the case of golden trout habitat).

Fish habitat improvement projects are proposed for streams in threatened trout habitat, in the Golden Trout Wilderness, and in concentrated recreation areas. The rewatering of streams currently dewatered for hydroelectric projects will reclaim additional fish habitat.

Watershed improvement in wet meadows reduces erosion and sedimentation, thereby improving fish habitat. Eroded streambanks and excessive sedimentation are primary fish habitat problems in the Golden Trout Wilderness. Watershed improvement complements the fish habitat improvement program in that wilderness, enhancing the amount and condition of fish habitat in associated streams.

While fish habitat improvement and watershed improvement can increase fish habitat capability; livestock grazing, energy devlopment, ski area development (as a stimulus for community growth), and developed summer recreation use have the potential to reduce that capability.

Livestock spend a disproportionate amount of time in riparian areas. Livestock can denude streambanks of protective vegetation, damage streambank structure, and cause sedimentation of stream channels with corresponding adverse effects on fish habitat quality and quantity. The magnitude of effects depends on the amount of grazing and the extent of protective mitigation measures applied.

Hydroelectric power development removes water from streams, thereby eliminating or reducing the amount of fish habitat. Concern about the impacts of new hydroelectric development is greatest where existing fishing use is greatest, primarily in concentrated recreation areas in the Sierra Nevada.

Some types of geothermal power plants rely on cold water to supply evaporative cooling towers. This cold water can be drawn from surface sources, groundwater sources, or recycled from cooling ponds. If geothermal facilities drew on surface water sources to meet all or part of those needs, the amount of geothermal development will be expected to affect water availability for fish (those effects will be mitigated to the extent that groundwater sources were used instead of surface water). There is also the possibility that spills from broken pipes could pollute surface water. The potential impacts of geothermal activities on Hot Creek are of particular concern, as Hot Creek is a designated wild trout stream in the general vicinity of proposed geothermal development.

Communities on the north end of the Forest are closely tied to the alpine ski industry. Increases in alpine ski area capacity stimulate population growth and, consequently, increase the demand for municipal water supplies. The amount of water available for fish declines to the extent that increased municipal demand is met by surface water sources. Due to the relationship between alpine skiing and community size, ski area capacity can be used as an indicator of impacts on fish habitat. (If groundwater is used as a domestic water source, impacts on fish habitat will be mitigated.)

Developed recreation sites are typically located near streams or lakes, and the amount of overall recreation use is concentrated in the area served by those sites. Developed site use is, therefore, an indicator of overall recreation use in the vicinity of lakes and streams. Heavy recreation use tends to result in trampled riparian vegetation, compacted soils, eroded streambanks, and increased stream channel sedimentation, all of which are detrimental to fish habitat capability. In addition, resident trout populations near developed recreation sites are subject to depletion by heavy fishing pressure.

Assumptions

The demand for water to serve geothermal activities in Lease Blocks I and II and for municipal use in Mammoth Lakes will have cumulative effects on designated wild trout waters in Hot Creek.

Rewatering of streams and fish habitat/watershed improvement projects have the greatest potential to improve the overall quality and quantity of resident fish habitat on the Inyo.

Habitat improvement projects will take place almost entirely in streams. Habitat improvement for lakes is not a major consideration since lake water quality is good overall, and most lakes on the Forest are within wilderness.

Activities associated with timber harvest will have few impacts on fish. There are few streams in suitable timber, and as most logging is conducted over the snow, soil erosion and sedimentation are minimized.

The vast majority of fishing on the Forest takes place in waters stocked by the California Department of Fish and Game. The stocking program is outside the control of the Forest Service. It is therefore assumed for analysis purposes that stocking will remain constant, and that only resident trout habitat, which is subject to Forest management, will change.

The effects of livestock on fish habitat can be mitigated by reducing the amount of time spent by livestock in streamside areas. This can be accomplished by fencing, salting, herding, water development, or deferring grazing.

All alternatives include Forest-wide Standards and Guidelines. Management Prescription and Management Area Direction which assure that, as a minimum, viable populations of all resident fish species will be maintained and that threatened trout will be managed to at least meet recovery levels. Best Management Practices (BMPs) and other protective measures are prescribed to control soil erosion and protect water quality, mitigating potential fish habitat losses due to Forest activities.

Habitat improvement in concentrated recreation areas is assumed to increase habitat capability. Those increases could, however, be offset by habitat losses due to increased recreation use of riparian areas.

Consequences Common to All Alternatives

Lake fish habitat capability will be constant under all alternatives; only stream habitat is considered for improvement.

All potential fish habitat improvement in the Golden Trout Wilderness (31 miles) will be accomplished under all alternatives.

Efforts will be made to rewater fifteen miles of stream when issuing new hydroelectric licenses under all alternatives.

The likelihood of energy development is assumed to be the same under each alternative. There are fifteen applications for new hydroelectric projects on Forest streams, some of which contain trout. Current agreements in Lease Blocks I and II north of Mammoth Lakes provide for geothermal exploration and development. Any development in that area poses a potential threat to Hot Creek wild trout fisheries. Additional proposals for geothermal leasing will be analyzed on a case-by-case basis.

Although overall grazing numbers vary by alternative, most increases are projected for lands located away from sensitive fish habitat. Grazing in the Golden Trout Wilderness, concentrated recreation areas, and threatened trout habitat are expected to be roughly equal for all alternatives.

Potential wild trout streams will not be adversely affected by management activities under any alternative.

Threatened Lahontan and Paiute cutthroat trouts will be managed to at least meet recovery under all alternatives.

Any activities that will affect water quality (see Watershed: Water) will also affect fish habitat.

Consequences That Vary By Alternative

Tables 72 and 73 display the effects of Forest activities on fish habitat capability by alternative over the next fifty years.

Table 72
Indicators of Consequences on Fish Habitat
(by the end of the fifth decade)

Indicator	Base Year 1982	Alternatives					
		PRF	CUR	RPA	CEE	AMN	AMB
Livestock grazing (M AUMs)	41.4	41.4	39.1	55.6	46.5	35.1	39.4
Summer developed recreation (M RVDs)	1.8	2.9	1.9	2.9	2.9	1.9	2.7
Watershed improvement (M acres)	0	23.5	2.0	9.9	23.5	23.5	23.5
Fish habitat improvement (acres)							
-direct improvement	0	243	178	286	317	257	279
-improvement induced from watershed work	0	227	27	131	304	304	304
-Total improvement	**0**	**470**	**205**	**417**	**621**	**561**	**583**

Table 73
Fish Habitat Improvement by Alternative
(by the end of the fifth decade)

Indicator	Base Year 1982	Alternatives					
		PRF	CUR	RPA	CEE	AMN	AMB
Direct stream fish habitat improvement (acres)							
-concentrated recreation areas	0	137	72	180	211	134	156
-Golden Trout Wilderness	0	56	56	56	56	56	56
-threatened trout habitat	0	23	23	23	23	40	40
-rewatering dewatered streams	0	27	27	27	27	27	27
Fish habitat improvement induced from watershed improvement in Golden Trout Wilderness (stream acres affected)	0	227	27	131	304	304	304
Stream trout (M pounds)							
- other than T&E	132.0	174.0	151.0	173.0	189.0	179.0	182.0
- (T&E)	0.1	0.7	0.7	0.7	0.7	1.2	1.2
Forest-wide change in stream fish habitat capability	N/A	+32%	+15%	+31%	+44%	+36%	+39%

PRF: (Preferred) Fish habitat and watershed improvement projects will increase stream habitat capability 32 percent. Fishing pressure and impacts on resident trout habitat will increase considerably on stream reaches in concentrated recreation areas in proportion to the 57 percent increase in summer developed recreation use.

Impacts related to livestock grazing will increase due to the nine percent increase in range outputs.

The net effect of beneficial and adverse effects on fish habitat will be a moderate improvement in habitat condition and a corresponding moderate improvement in recreational fishing quality.

CUR: (Current Program) Fish habitat and watershed improvement projects will increase stream habitat capability 15 percent. Fishing pressure and impacts on resident trout habitat will remain the same on stream reaches in concentrated recreation areas due to the lack of increased summer developed recreation use. Community growth in support of 39,000 SAOT will represent nearly double the current demand for domestic water supplies.

Impacts related to livestock grazing will increase slightly. Although outputs will decline over five decades, the adjustment of animal numbers will lag behind declining range condition, forcing livestock to graze in riparian areas more than they do at present.

The net effect of beneficial and adverse effects on fish habitat will be a moderate reduction in habitat condition and a corresponding moderate reduction in recreational fishing quality, due primarily to impacts associated with increased livestock grazing.

RPA: (1980 RPA Program) Fish habitat and watershed improvement projects will increase stream habitat capability 31 percent. Fishing pressure and impacts on resident trout habitat will increase considerably on stream reaches in concentrated recreation areas in proportion to the 57 percent increase in summer developed recreation use. Community growth in support of 46,000 SAOT will represent more than twice the current demand for municipal water supplies.

Impacts related to livestock grazing will increase due to the 34 percent increase in range outputs.

The net effect of beneficial and adverse effects on fish habitat will be a substantial reduction in habitat condition and a corresponding reduction in recreational fishing quality, due to impacts associated with dramatically increased commodity production.

CEE: (Maximize Cost-Efficiency) Fish habitat and watershed improvement projects will increase stream habitat capability 44 percent. Fishing pressure and impacts on resident trout habitat will increase considerably on stream reaches in concentrated recreation areas in proportion to the 57 percent increase in summer developed recreation use. Community growth in

support of 61,000 SAOT will represent three times the current demand for municipal water supplies.

Impacts related to livestock grazing will increase due to the 12 percent increase in range outputs.

The net effect of beneficial and adverse effects on fish habitat will be a slight improvement in habitat condition and a corresponding slight improvement in recreational fishing quality.

AMN: (Maximize All Amenities) Fish habitat and watershed improvement projects will increase stream habitat capability 36 percent. Fishing pressure and impacts on resident trout habitat will remain the same on stream reaches in concentrated recreation areas in proportion to the lack of increase in summer developed recreation use. Community growth in support of 31,000 SAOT will represent a 50 percent increase over the current demand for municipal water supplies.

Impacts related to livestock grazing will decline due to the 15 percent reduction in range outputs.

The net effect of beneficial and adverse effects on fish habitat will be a substantial improvement in habitat condition and a corresponding improvement in recreational fishing quality.

AMB: (Emphasize Wildlife and Recreation) Fish habitat and watershed improvement projects will increase stream habitat capability 39 percent. Fishing pressure and impacts on resident trout habitat will increase moderately on stream reaches in concentrated recreation areas in proportion to the 50 percent increase in summer developed recreation use. Community growth in support of 43,000 SAOT will represent more than twice the current demand for domestic water supplies.

Impacts related to livestock grazing will decline due to the five percent reduction in range outputs.

The net effect of beneficial and adverse effects on fish habitat will be a moderate improvement in habitat condition and a corresponding moderate improvement in recreational fishing opportunities.

FURTHER PLANNING AREAS

The Forest activity that has the greatest potential effect on Further Planning Areas is the recommendation of wilderness designation or non-wilderness resource management (including, for example, timber management, intensive range management, wildlife habitat management, vehicle-based recreation, and energy and mineral exploration and development) for specific Further Planning Areas.

The consequences of these recommendations are expressed in terms of the wilderness characteristics of Further Planning Areas (natural ecological integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation) and the non-wilderness management and development opportunities in those areas.

Data sources for this analysis include area-specific information collected as part of the RARE II study, planning records from the 1983-84 reevaluation of Roadless Areas, the Forest data base, memoranda and correspondence files, Forest resource inventories, the FORPLAN analysis, and professional knowledge and judgment about Further Planning Areas on the Forest.

The following discussion addresses the consequences of alternatives on the eighteen Further Planning Areas on the Forest, taken as a whole. Effects are examined in terms of effects both on wilderness characteristics and on non-wilderness resources and opportunities in those areas. The consequences of each alternative on individual Further Planning Areas are discussed in detail in Appendix C.

Indicators

1. Selected resource outputs
2. Management Prescriptions (Rx) applied.

Selected resource outputs are an indication of potential wilderness outputs (wilderness recreation RVDs) versus potential non-wilderness outputs (such as timber MMBF or non-wilderness recreation RVDs) for Further Planning Areas taken as a whole.

The various Management Prescriptions applied to Roadless Areas under different alternatives are a broad indication of potential consequences on the wilderness characteristics of those areas. Prescriptions describe the resources emphasized and the standards and guidelines that apply to specific areas of land. For purposes of this discussion, Management Prescriptions have been grouped into four categories:

1. Wilderness Prescriptions: The Proposed Wilderness Prescription (Rx #2) applied to recommended wilderness areas with the assumption that the Designated Wilderness Prescription (Rx #1) will be applied once Congress has acted on the recommendation. Rx #1 provides for primitive recreation use while ensuring the perpetuation of wilderness characteristics. Vehicular travel, motorized equipment, timber harvest, road building, new mineral claims, energy developments, and most vegetation manipulation will be prohibited in designated wilderness. Grazing and existing mineral claims will be regulated to minimize conflicts with wilderness values. Even the amount of wilderness recreation use will be limited as necessary to protect wilderness resources. Rx #2, an interim management prescription applied until Congress designates the area, provides for traditional uses of the area while protecting wilderness values until designation has occurred.

2. Management Prescriptions Emphasizing Amenity Values: Management Prescriptions #3, #4, #5, #6, #7, #8, and #17 will be expected to have few adverse effects on wilderness characteristics.

Natural ecological integrity will be affected only by vegetation treatment for wildlife habitat enhancement. Such treatments approximate natural processes, however, and the ecological effects are temporary (20 to 70 years) and localized. The natural appearance of acres in these areas is likely to change only slightly. The visible impacts of mineral activity and vegetation treatments will be temporary and/or localized.

Opportunities for solitude will be reduced in proportion to overall increases in dispersed recreation on the Forest. Those areas adjacent to concentrated recreation areas will receive the greatest impact. Opportunities for primitive recreation will not change much from the present. As no new roads will be built, the current mix of four-wheel drive and non-motorized recreation will be expected to continue.

3. Management Prescriptions Emphasizing Concentrated Recreation Use: Management Prescriptions #12, #13, #14, #15, and #16 allow for road and facility development and invite heavy visitation. They also provide a moderate-to-high level of visual quality protection.

   These prescriptions will have the greatest effects on opportunities for solitude, due to the intensity and density of recreation use. Effects on natural integrity and primitive recreation opportunities will also be noted as more roads and facilities were developed and land disturbed. Effects on natural appearance will be modified by stringent Visual Quality Objectives under most of these prescriptions. The alpine ski area prescription will have the greatest effect on natural appearance.

4. Management Prescriptions Emphasizing Commodity Production: Management Prescriptions #9, #10, #11 and #18 allow for road building, energy and mineral development, timber harvest, and vegetation manipulation for range improvement.

   Natural integrity and natural appearance will be affected to the extent that land-disturbing activities actually occur. The amount of actual acreage managed for timber production will represent a large percent of total acres under Timber Prescriptions. The amount of actual Range treatment under the Range Prescription or mineral development under the Multiple Resource Area Prescription will probably be small in comparison with the total acreage under those prescriptions. Opportunities for solitude will not be greatly reduced under these prescriptions. Commodity management does not tend to increase human use except in a temporary and localized manner. The greatest potential impacts of these prescriptions will be the loss of primitive recreation opportunities on any lands accessible by new roads. Once vehicle access is established or improved, the character of use in the area served by that access shifts noticeably away from the primitive.

The consequences of alternatives on Further Planning Areas are projected for the end of the fifth decade. The timing of changes leading up to that point are not especially important since significant effects on wilderness characteristice are irreversible, the long-term picture is the critical one.

Assumptions

It is assumed, due to the relationships discussed above, that Management Prescriptions that allow or provide for road building, land disturbance, vegetation manipulation, and/or concentrated human use will have the most adverse effects on the wilderness characteristics of Roadless Areas. It is also assumed that, if non-wilderness use and development oportunities are available in Roadless Areas, they will actually take place.

It is also assumed that prescriptions with an amenity emphasis represent a low probability of adverse effects on wilderness characteristices. The designated Wilderness Prescription is assumed to represent the highest level of protection for such characteristics. These assumptions apply only in general terms. There are always site-specific exceptions.

Although road building is allowed under many Prescriptions, the actual number of road miles will probably be limited by steep topography and economic considerations. The number of acres under such prescriptions is, therefore, only a broad and indirect indicator of total miles of road likely to be constructed on those acres.

Likewise, although vegetation manipulation for range or wildlife may be permitted or encouraged under a given prescription, the amount of treatment is likely to be limited by technical feasibility and economic considerations.

Although mineral development is permissible under most prescriptions, the amount and location of such development is very difficult to predict accurately. The location and extent of the resource and the relevant economic variable are highly speculative.

Consequences Common to All Alternatives

As shown in Table 74, commodity resource outputs from Further Planning Areas do not differ greatly from one alternative to another. This fact reflects a low level of commodity production potential in such areas on a Forest-wide basis. Individual areas have pockets of land suitable for timber management, intensive range management, or intensive wildlife management, but none of the Further Planning Areas have alpine ski area or summer developed site potential. See Appendix C for a display of outputs for individual areas.

Table 74
Selected Resource Outputs for Further Planning Areas Taken as a Whole
(average annual outputs - fifth decade)

	Alternatives					
Output	PRF	CUR	RPA	CEE	AMN	AMB
Recommended Wilderness (M acres)	172.6	107.6	0	339.8	510.8	222.7
Non-wilderness (M acres)	451.2	516.2	623.8	284.0	113.0	401.1
Developed Recreation (M RVDs)	0	0	0	0	0	0
Non Wilderness Dispersed Recreation (M RVDs)	35.5	37.0	46.4	7.9	2.5	15.7
Wilderness Recreation (M RVDs)	15.5	14.0	0	56.3	72.5	39.1
Wildlife and Fish User Days (M WFUDs)	42.8	42.6	43.7	36.3	34.5	35.1
Grazing (M AUMs)	9.6	10.3	10.4	8.5	8.1	9.6
Suitable Timber Land (M acres)	0	0	1.1	0	0	0
Timber Volume						
(MMCF)	0	0	0.1	0	0	0
(MMBF)	0	0	0.7	0	0	0
Gross Benefits (MM$)	1.9	1.9	2.0	2.2	2.1	2.0
Total Costs (MM$)	0.6	0.6	0.6	0.8	0.7	0.6
Net Benefits (MM$)	1.3	1.3	1.4	1.4	1.4	1.4

Table 75
Acreage Allocations by Prescription
Further Planning Areas Taken as a Whole
(M acres)

		Alternatives					
Management Prescription (Rx)		**PRF**	**CUR**	**RPA**	**CEE**	**AMN**	**AMB**
1.	Designated Wilderness	0	0	0	0	0	0
2.	Proposed Wilderness	172.6	107.6	0	339.8	510.8	222.7
3.	Mountain Sheep	30.1	27.1	0	0	0	27.1
4.	Mule Deer	13.8	0	0	9.0	12.1	13.0
5.	Research Natural Area*	11.8	11.8	11.8	3.3 (8.5)	0 (11.8)	8.5 (3.3)
6.	Mono Basin NF Scenic Area*	4.8	4.8	4.8	0 (4.8)	0 (4.8)	0 (4.8)
7.	Ancient Bristlecone Pine Forest*	22.3	22.4	22.41	16.4 (6.0)	16.4 (6.0)	22.4
8.	Wild and Scenic River	0	0	0	0	0	0
9.	Uneven-aged Timber Mgmt.	0	0	0	0	0	0
10.	High Level Timber Mgmt.	0	0	1.1	0	0	0
11.	Range	2.0	35.8	41.9	2.4	1.5	1.5
12.	Concentrated Rec. Area	0	0	0	0	0	0
13.	Alpine Ski Area	0	0	0	0	0	0
14.	Potential Alpine Ski Area	0	0	0	0	0	0
15.	Developed Rec. Site	0	0	0	0	0	0
16.	Dispersed Recreation	0	0	0	0	0	0
17.	Semi-Primitive Recreation	305.1	163.1	57.0	5.6	83.0	309.4
18.	Multiple Resource Area	121.2	251.2	484.89	247.3	0	24.3

*Acres with dual designation (proposed wilderness and RNA, Scenic Area, etc.) are displayed in the acreage total for Prescription #2 and indicated in parentheses under the other applicable prescription.

Consequences That Vary by Alternative

PRF (Preferred): In this alternative, 28 percent of total acres in Further Planning Areas will be recommended for wilderness, resulting in 38 percent of total Forest lands under wilderness designation.

Of the four Further Planning Areas recommended for wilderness the area most likely to be affected by wilderness designation will be the White Mountain area. Opportunities for wilderness recreation in that area are moderate, and trail-building opportunities are available. Recreation use will therefore be expected to increase, and opportunities for solitude to decrease somewhat under wilderness designation. The Tioga Lake and Table Mountain areas are already seen by the general public as part of existing wildernesses; use of those areas will be expected to increase under wilderness designation, but overall changes will be slight. The Paiute-Mazourka area currently receives little use, and due to the lack of water in that area little increase in use will be expected.

Management Prescriptions with an emphasis on amenity values will be applied to 52 percent of Further Planning Areas. Wilderness characteristics on such acres will be expected to change very little by the end of the fifth decade.

Management Prescriptions with an emphasis on commodity production and ease of access will be applied to 20 percent of Further Planning Areas. Wilderness characteristics in these areas could be reduced over the planning horizon; opportunities for solitude will be the characteristic that will be the least changed, as these prescriptions do not foster intense visitation.

CUR: (Current Program): In this alternative 17 percent of total acres in Further Planning Areas will be recommended for wilderness, resulting in 35 percent of total Forest lands under wilderness designation.

Of the two Further Planning Areas recommended for wilderness, the area most likely to be affected by wilderness designation will be the White Mountain area. Opportunities for wilderness recreation in that area are moderate, and trail-building opportunities are available. Recreation use will therefore be expected to increase, and opportunities for solitude to decrease somewhat under wilderness designation. The Paiute area currently receives little use, and (due to the lack of water in that area) little increase in use will be expected.

Management Prescriptions with an emphasis on amenity values will be applied to 37 percent of Further Planning Areas. Wilderness characteristics on such acres will be expected to change very little by the end of the fifth decade.

Management Prescriptions with an emphasis on commodity production and ease of access will be applied to 46 percent of Further Planning Areas. Wilderness characteristics in these areas could be reduced over the planning horizon; opportuties for solitude will be the characteristic that will be the least changed, as these prescriptions do not foster intense visitation.

RPA (1980 RPA Program): In this alternative, none of the acreage in Further Planning Areas will be recommended for wilderness. Existing wilderness represents 30 percent of total Forest lands.

Management Prescriptions with an emphasis on amenity values will be applied to 15 percent of Further Planning Areas. Wilderness characteristics in such acres will be expected to change very little by the end of the fifth decade.

Management Prescriptions with an emphasis on commodity production and ease of access will be applied to 85 percent of Further Planning Areas. Wilderness characteristics in these areas could be reduced over the planning horizon; opportunities for solitude will be the characteristic that will be the least changed, as these prescriptions do not foster intense visitation.

CEE (Maximize Cost-Efficiency): In this alternative 54 percent of total acres in Further Planning Areas will be recommended for wilderness, resulting in 47 percent of total Forest lands under wilderness designation.

Of the six Further Planning Areas recommended for wilderness, the areas most likely to be affected by wilderness designation will be Coyote Southeast and White Mountains. Current use in the Coyote Southeast area centers on four-wheel drive access. That type of use will be limited to road corridors in this alternative. Primitive recreation opportunities in the area are moderate, and will increase once vehicle-based recreation was excluded. Opportunities for wilderness recreation in the White Mountains are moderate, and trail-building opportunities are available. Recreation use will therefore be expected to increase, and opportunities for solitude to decrease somewhat under wilderness designation

The Laurel-McGee, Tioga Lake, Hall, and Log Cabin-Saddlebag areas are already seen by the general public as part of existing wildernesses; use of those areas will be expected to increase under wilderness designation, but overall changes will be slight.

Management Prescriptions with an emphasis on amenity values will be applied to 5 percent of Further Planning Areas. Wilderness characteristics on such acres will be expected to change very little by the fifth decade.

Management Prescriptions with an emphasis on commodity production and ease of access will be applied to 41 percent of Further Planning Areas. Wilderness characteristics in these areas could be reduced over the planning horizon. Opportuties for solitude will be the characteristic that will be the least changed, as these prescriptions do not foster intense visitation.

AMN (Maximize All Amenities): In this alternative 82 percent of total acres in Further Planning Areas will be recommended for wilderness, resulting in 56 percent of total Forest lands under wilderness designation.

Of the twelve Further Planning Areas recommended for wilderness, the areas most likely to be affected by wilderness designation will be the Coyote Southeast and White Mountain areas. (See the CEE effects on Coyote listed above.)

The Table Mountain, Wheeler Ridge, Tioga Lake, Hall, and Log Cabin-Saddlebag, areas are already seen by the general public as part of existing wildernesses; use of those areas will be expected to increase under wilderness designation, but overall changes will be slight.

The Buttermilk, Horse Meadow, Benton Range, Andrews Mountain, and Paiute areas currently receive little use. The lack of recreational attractions and/or lack of water will prevent use from increasing substantially under wilderness designation.

Management Prescriptions with an emphasis on amenity values will be applied to the remaining 18 percent of Further Planning Areas. Wilderness characteristics on such acres will be expected to change very little by the end of the fifth decade.

AMB (Emphasize Wildlife and Recreation): In this alternative 36 percent of total acres in Further Planning Areas will be recommended for wilderness, resulting in 41 percent of total Forest lands under wilderness designation.

Of the six Further Planning Areas recommended for wilderness, the area most likely to be affected by wilderness designation will be the White Mountain area. Opportunities for wilderness recreation in that area are moderate, and trail-building opportunities are available. Recreation use will therefore be expected to increase, and opportunities for solitude to decrease somewhat under wilderness designation.

The western third of Coyote Southeast, Laurel-McGee, Tioga Lake, and Log Cabin-Saddlebag areas are already seen by the general public as part of existing wildernesses; use of those areas will be expected to increase under wilderness designation, but overall changes will be slight.

The Paiute-Mazourka area currently receives little use, and (due primarily to a lack of water) little increase in use will be expected.

Management Prescriptions with an emphasis on amenity values will be applied to 61 percent of Further Planning Areas. Wilderness characteristics on such acres will be expected to change very little by the fifth decade.

Management Prescriptions with an emphasis on commodity production and ease of access could be applied to 3 percent of Further Planning Areas. Wilderness characteristics in these areas will be reduced over the planning horizon; opportunities for solitude will be the characteristic that will be the least changed, as these prescriptions do not foster intense visitation.

GEOLOGY

Introduction

Those elements of the geologic resource subject to consequences under the alternatives are groundwater, mineral materials, outstanding geologic features, and geologic processes active within the Forest boundary. Forest activities that could affect geologic resources include facility

construction, geothermal energy production, recreation management, and wilderness recommendations.

Consequences of these activities are assessed in terms of the availability of and consumption rate for groundwater, the protection afforded to outstanding geologic features, and the level of risk to Forest users from geologic processes. Mineral materials are discussed under the heading of Minerals. Data sources for this analysis include an inventory of geologic hazards on the Inyo National Forest, an inventory of consumptive water use on the Inyo National Forest, and the projected outputs for these elements under each alternative.

Indicators

1. Groundwater

   - Geothermal development

   - Ski area development

   - Recreation site development

   - Community size.

2. Outstanding geologic features

   - Special interest area candidates

   - Wilderness recommendations.

3. Geologic processes (slope stability and seismic processes)

   - New road construction

   - Geothermal development.

Recreational facility use, ski area use, geothermal power production, and home and business consumption within communities are the major sources of demand for groundwater consumption which could be expected on the Inyo National Forest during the next 50 years. The demand for groundwater to supply ski areas, recreation sites, and geothermal sites will be proportional to the amount of development. The demand for water to supply communities will be roughly proportional to alpine ski area capacity, as the communities with the greatest potential need for water from on-Forest groundwater sources are those with the greatest economic dependency on alpine skiing.

Geothermal power plants represent a wide range of possible water consumption. Consumption can range from none at all (for a small power plant) to approximately 3,100 ac-ft/year for a very large power plant supplying all of its water needs from outside sources. The consumption for most facilities will be less than the maximum possible because condensate from geothermal steam will supply some of the demand. The needed water could be supplied by either groundwater or surface sources, or a combination of the two. This discussion will assume that only groundwater sources are used.

Outstanding geologic features included in designated wilderness will be protected from inadvertant damage by heavy recreational use and land-disturbing activities. Features included in a special interest area will be managed for protection of the feature as well as for interpretation and public enjoyment.

Geologic processes can result in events such as earthquakes, landslides, rock falls, lava flows and ash falls. These events often dramatically change the land itself and adversely affect people, both during and after the event. Land uses are influenced by the location of geologic events and by the size of the area affected. Land uses also occasionally influence the location and timing of geologic events. For example, road and facility construction needed to support timber harvest, energy development and developed recreation could induce slope failure; geothermal energy production could increase earthquake activity or initiate ground subsidence.

People who use the land are subject to some level of risk when they enter areas where events occur naturally or have been influenced by previous land use. That level of risk could change with changes in land use. In addition, concentration of recreation use can increase risks by interfering with rapid evacuation in case of a geologic event.

Assumptions

Groundwater is considered a renewable resource since a yearly supply is available to replace or partially replace the water consumed. Over a long period of time, however, groundwater is a finite resource and availability will depend on the relationship of supply and demand.

Outstanding geologic features are considered a nonrenewable resource. Once a feature is altered so that its uniqueness is gone, the resource is irretrievably lost.

None of the alternatives will have any effect on volcanic processes. The alternatives will affect neither the forces that cause a volcanic eruption nor the surface effects of an eruption.

Forest-wide Standards and Guidelines deal with the need to consider risks from geologic processes, the need to assess groundwater supplies on a Forest-wide basis, the need to evaluate and make recommendations for geologic Special Interest Area candidates, and the need to consider geologic Research Natural Areas as a component of the Regional RNA program. There are however, no standards or guidelines that directly protect outstanding geologic features from the impacts of Forest activities.

Table 76
Estimated Demand for Groundwater
by the end of the fifth decade
(acre-feet/year)

Indicators	Alternatives					
	PRF	CUR	RPA	CEE	AMN	AMB
Developed recreation site use						
-existing use	105	105	105	105	105	105
-conversion from surface sources for existing needs	43	43	43	43	43	43
-new sources for projected needs	81	0	99	81	3	47
Community use						
-conversion from surface sources for existing needs	1480	1480	1480	1480	1480	1480
-new sources for existing needs	1480	1480	1480	1480	1480	1480
-new sources for projected needs	3000	3000	3000	6000	750	3000
Ski area use						
-existing use	300	300	300	300	300	300
-new sources for existing needs	300	300	300	300	300	300
-new sources for projected needs	600	600	600	1200	300	600
Total existing use	**405**	**405**	**405**	**405**	**405**	**405**
Total increased use	**6984**	**6903**	**7002**	**10584**	**4356**	**6950**
TOTAL PROJECTED USE	**7389**	**7308**	**7407**	**10989**	**4761**	**7355**

Consequences Common to All Alternatives

The Forest Service currently uses 105 ac-ft/year of groundwater to support existing facilities. An additional 43 ac-ft/year currently being supplied to existing facilities by surface sources will be converted to groundwater sources under all alternatives.

Identified geologic Special Interest Area candidates will be evaluated, and recommendations made by 1990 under all alternatives.

A number of outstanding geologic features will be protected by their location in existing wilderness, Research Natural Areas, the Ancient Bristlecone Pine Forest, and the Mono Basin National Forest Scenic Area under all alternatives.

The Town of Mammoth Lakes will improve its existing water-supply base by withdrawing 2,960 ac-ft of groundwater per year that are not currently withdrawn. The remaining current demand will be supplied from surface sources. Mammoth Mountain ski area will withdraw 600 ac-ft/year to support existing needs under all alternatives.

The amount of estimated geothermal development (six power plants in Lease Blocks I and II) and the amount of groundwater potentially used by those plants (from 0 to 18,600 ac-ft/year) will be common to all alternatives. Geothermal development will also include increased potential for slope failure from facility development and for seismic activity induced by fluid injection.

The development of geothermal resources, which could occur under all alternatives, could affect the thermal features in the Hot Creek Gorge. These features are identified as special geologic features and are candidates for a Special Interest Area classification.

Consequences That Vary by Alternative

PRF: (Preferred) The demand for groundwater relative to existing needs will nearly double by the end of the fifth decade due to new recreation facilities, ski areas, and increased community demand.

Four recommended wilderness additions (172,600 acres) will constitute a moderately low level of protection for outstanding geological features.

The potential for increased slope failure in areas with steep slopes will be relatively high, due to the construction of 87 miles of new road (including geothermal access), increased ski area capacity of 9,000 SAOT, and construction of recreation facilities to support 14,000 new PAOT. The rapid evacuation of concentrated recreation areas will be more difficult with increased use, increasing the risk to Forest visitors represented by geologic events.

CUR: (Current Program) The demand for groundwater relative to existing needs will nearly double by the end of the fifth decade due to new ski areas and increased community demand.

Two recommended wilderness additions (107,600 acres) will constitute a moderately low level of protection for outstanding geological features.

The potential for increased slope failure in areas with steep slopes will be moderate-to-low, as only 33 miles of new road (including geothermal access) and no new recreation facilities will be constructed; ski area capacity will, however, increase by 19,000 SAOT. Opportunities for rapid evacuation of concentrated recreation areas will not change, as recreation use will not increase from current levels; the risk to Forest visitors represented by geologic events will, therefore, remain the same.

RPA: (1980 RPA Program) The demand for groundwater relative to existing needs will nearly double by the end of the fifth decade due to new ski areas, new recreation developments, and increased community demand.

As there will be no recommended wilderness additions, outstanding geologic features outside of existing wilderness or candidate Special Interest Areas will be unprotected.

The potential for increased slope failure in areas with steep slopes will be relatively high, due to the construction of 115 miles of new road (including geothermal access), new alpine ski area capacity amounting to 26,000 SAOT, and new recreation facilities to serve 17,000 PAOT. Opportunities for rapid evacuation of concentrated recreation areas will be reduced by increased use of those areas; the risk to Forest visitors represented by geologic events will, therefore, increase.

CEE: (Maximize Cost-Efficiency) The demand for groundwater relative to existing needs will nearly triple by the end of the fifth decade due to new ski areas, new recreation developments, and increased community demand.

As six Further Planning Areas (339,800 acres) will be recommended for wilderness, the level of protection for outstanding geologic features will be moderately high.

The potential for increased slope failure in areas with steep slopes will be highest under this alternative, due to the construction of 77 miles of new road (including geothermal access), new alpine ski area capacity amounting to 41,000 SAOT, and new recreation facilities to serve 14,000 PAOT. Opportunities for rapid evacuation of concentrated recreation areas will be reduced by increased use of those areas; the risk to Forest visitors represented by geologic events will, therefore, increase.

AMN: (Maximize All Amenities) The demand for groundwater relative to existing needs will increase by a third by the end of the fifth decade due to increased ski area capacity and increased community demand.

As twelve Further Planning Areas (510,800 acres) will be recommended for wilderness, the level of protection for outstanding geologic features will be high.

The potential for increased slope failure in areas with steep slopes will be relatively low, as only 26 miles of new road (including geothermal access), 600 PAOT of new recreation sites, and 11,000 new SAOT will be developed. Opportunities for rapid evacuation of concentrated recreation areas will be unchanged, as use of those areas will remain the same; the risk to Forest visitors represented by geologic events will also, therefore, remain the same.

AMB: (Emphasize Wildlife and Recreation) The demand for groundwater will nearly double by the end of the fifth decade due to new ski areas, new recreation developments, and increased community demand.

As six Further Planning Areas (222,700 acres) will be recommended for wilderness, the level of protection for outstanding geologic features will be moderate.

The potential for increased slope failure in areas with steep slopes will be moderate due to the construction of 50 miles of new road (including geothermal access), new alpine ski area capacity amounting to 23,000 SAOT, and new recreation facilities to serve 8,300 PAOT. Opportunities for rapid evacuation of concentrated recreation areas will be reduced by increased use of those areas; the risk to Forest visitors represented by geologic events will, therefore, increase.

LANDS

Forest activities that have major effects on the lands program include recreation management, minerals management, wildlife management, and energy development.

Lands administration activities occur in response to resource needs, laws, regulations, and policies regarding boundary adjustments, landline surveys, occupancy trespass, landownership adjustments, special land uses, rights-of-way, transportation and utility corridors, and withdrawals.

Consequences of these resource management activities on the lands program are assessed in terms of changes in landownership adjustments and land uses under special use permit. The Forest planning alternatives will not affect most other aspects of the lands program. Withdrawals are discussed under the heading of Minerals.

Indicators

1. Ski area capacity
2. Alternative theme.

Landownership adjustments on the Forest focus heavily on lands surrounding the communities of Mammoth Lakes and (to a lesser degree) June Lake. The amount of landownership adjustment associated with community needs is related directly to the size of those communities and to ski area development as the major economic stimulus for community growth.

The demand for community service land uses under special use permit is also affected by community size and, therefore, by ski area capacity.

Certain private lands within the Forest boundary have significant recreation development or wildlife habitat values. Although such lands are a high priority for acquisition under any alternative, that priority is emphasized under alternatives with a recreation or wildlife emphasis.

Consequences Common to All Alternatives

Overall priorities for land acquisition and land disposal are stated in the Forest-wide Standards and Guidelines common to all alternatives.

Land acquisition will always be subject to the landowner's interest in disposing of lands and the availability of funds for purchase (or National Forest land suitable for exchange).

Rights-of-way and landline surveys will not differ appreciably between alternatives except for the RPA alternative, which proposes to meet the RPA goal for landline surveys.

Geothermal development within existing or future leased areas could require powerline rights-of-way for low voltage powerlines should power production facilities be built. It may not be possible to co-locate these powerline rights-of-way with existing rights-of-way.

Consequences that Vary by Alternative

PRF: (Preferred) This alternative envisions moderately high levels of demand for landownership adjustment and special use permits related to community needs. The emphasis on increased summer recreation opportunities places special importance on the acquisition of lands with recreation potential.

CUR: (Current Program) This alternative envisions nearly twice the ski area capacity as in 1982 and moderately high levels of demand for landownership adjustment and special use permits related to community needs. As there are no projected increases in summer recreation opportunities, there will be no special emphasis on acquiring lands for that purpose.

RPA: (1980 RPA Program) This alternative envisions more than twice the ski area capacity as in 1982 and moderately high levels of demand for landownership adjustment and special use permits related to community needs. The emphasis on increased summer recreation opportunities places special importance on the acquisition of lands with recreation potential. In addition, landline surveys are projected at a rate of 33 miles per year in order to meet the RPA goal.

CEE: (Maximize Cost-Efficiency) This alternative envisions nearly three times the ski area capacity as in 1982 and extremely high levels of demand for landownership adjustment and special use permits related to community needs. The emphasis on increased summer recreation opportunities places special importance on the acquisition of lands with recreation potential.

AMN: (Maximize All Amenities) This alternative envisions a 50 percent increase in ski area capacity over 1982 and moderate levels of demand for landownership adjustment and special use permits related to community needs. As few new recreation developments are proposed, there is no special emphasis on the acquisition of lands with recreation potential. The amenity emphasis, however, increases the importance of acquiring private lands with wildlife habitat value.

AMB: (Emphasize Wildlife and Recreation) This alternative envisions more than twice the ski area capacity as in 1982 and moderately high levels of demand for landownership adjustment and special use permits related to community needs. As increased summer recreation opportunities are moderate, the importance of acquiring lands with recreation potential will also be moderate. The wildlife emphasis will increase the importance of acquiring lands with habitat value.

MINERALS

Introduction

Forest activities that have major effects on locatable mineral opportunities include mineral withdrawals and wilderness recommendations. The Forest emphasis on aminity values, such as visual quality, wildlife habitat, and recreation, and on other resource values, such as water quality, soil productivity, and vegetation may affect specific mineral exploration or development proposals and site access. Activities with effects on saleable mineral (mineral material) management include facility and road construction and community growth.

Consequences of these management activities are assessed in terms of lands suitable for mineral exploration and development, geothermal development scenarios, and the supply of mineral materials as it relates to demand.

Data sources for this analysis include mineral potential ratings in the Forest data base, approved environmental assessments for geothermal leasing in Lease Blocks I and II, and the Forest-wide inventory of mineral materials.

Indicators

The following indicators were used to assess the effects of each alternative.

1. Locatable minerals
   - Mineral withdrawals
   - Wilderness recommendations.

2. Leasable minerals
   - Geothermal leasing decisions.

3. Mineral materials
   - Road construction/reconstruction
   - Geothermal power plants
   - New alpine ski area capacity
   - New developed recreation site capacity
   - Other uses (county, state, private, etc.).

Designated wilderness areas and lands that are withdrawn from mineral entry both represent a loss of mineral opportunity, as new mining claims cannot be filed and developments on valid existing claims could be prohibited or restricted. The relative importance of overall opportunity loss is indicated by the mineral-potential rating of the lands withdrawn. The loss of lands

with low mineral-potential ratings is of less concern than those with high or medium mineral-potential ratings.

Decisions to issue leases for geothermal exploration and development are based on site-specific environmental analyses and documentation. The decisions to offer geothermal leases in Lease Blocks I and II of the Mono-Long Valley KGRA (north and east of Mammoth Lakes) have already been made. Surface occupancy stipulations and other mitigation measures will limit development in those lease blocks to approximately 300 acres (an estimated six power plants). Any additional leasing proposals will be evaluated on a case-by-case basis.

The volume of mineral materials consumed will be proportional to the amount of projected construction. Roads, power plants, ski areas, recreational facilities, and uses by other private and government entities represent the major types of construction which will be expected on the Forest over the next 50 years.

1. Roads are constructed and reconstructed for timber management, developed recreation site access, and geothermal power developments.

2. Ski areas, other developed recreation sites, and geothermal plants require mineral materials for facilities (such as parking areas and base facilities) in addition to roads.

3. The urban growth associated with new alpine ski area development will place an additional demand on mineral materials for county and private sector construction within Mammoth and June Lake.

Depletion of construction material sources will occur faster on some areas of the Forest than others because neither supply nor demand are uniformly distributed. Alternatives will differ in the availability of materials from new sources by imposing different patterns of Management Prescriptions with different constraints. The effects of this difference will be reflected in the costs of constructing facilities and roads in areas adjacent to depleted sources. Management Prescriptions could also change the availability and utilization of existing sites.

Assumptions

The public demand for locatable mineral exploration and development is projected to change little from the 1982 base year level for all alternatives.

Most locatable mineral exploration and development will take place in the White and Inyo Mountains.

Exploration for oil and gas is not expected to take place on the Forest.

The following assumptions are used in the calculation of mineral material supply figures:

1. The average new or reconstructed road is defined as a single lane with turnouts, 12-foot top width, 3-foot shoulder and 6-inch aggregate thickness requiring 2,640 tons of aggregate per mile.

2. The average weight of construction material is 1.8 tons per cubic yard.

3. Average annual consumption is defined as tons-per-year needed to support road reconstruction and construction.

4. Supply life is defined as the inventoried supply (1.98 million tons) divided by the average annual consumption in tons per year.

Consequences Common to All Alternatives

Mineral exploration and development proposals result from sources beyond the control of the Forest Service in response to somewhat unpredictible minerals market conditions. These conditions are outside the scope of the plan and will occur regardless of alternative. All forest land not specifically withdrawn from mineral entry is open to mineral activity including the right of the claimant to reasonable entry.

Existing wilderness (565,100 acres), the Ancient Bristlecone Pine Forest (28,887 acres), the Mono Basin National Forest Scenic Area (45,000 acres), and all existing and recommended Research Natural Areas (14,900 acres outside wilderness) will be closed to mineral entry under all alternatives. Only recommended wilderness acreage will vary by alternative.

Geothermal development will take place in Lease Blocks I and II in all alternatives. Full development is projected as six power plants; 300 acres will actually be occupied by facilities, while approximately 4,000 acres will be affected.

Consequences that Vary by Alternative

The following figures are helpful in understanding the effects of alternatives on minerals management. Table 77 displays acres available for mineral entry by mineral-potential rating for each alternative. Table 78 displays the relative demand for mineral materials under each alternative.

Table 77
Lands Available for Mineral Entry
(M acres)

Indicator	Alternatives					
	PRF	CUR	RPA	CEE	AMN	AMB
Lands withdrawn from mineral entry (M acres)						
-Mineral potential high	26.6	26.3	23.5	50.6	10.7	72.3
-Mineral potential medium	34.5	32.4	5.0	78.7	101.6	34.2
-Mineral potential low	195.0	132.3	55.0	289.1	381.0	194.9
-Existing wilderness*	565.1	565.1	565.1	565.1	565.1	565.1
-TOTAL	**761.2**	**756.2**	**648.6**	**983.5**	**1158.4**	**866.5**
Lands available for mineral entry (M acres)						
-Mineral potential high	108.2	107.5	110.4	84.3	28.1	62.6
-Mineral potential medium	174.5	176.6	204.1	130.3	107.4	174.8
-Mineral potential low	825.8	888.4	965.8	731.6	639.7	825.9
-TOTAL	**1168.5**	**1172.5**	**1280.3**	**946.2**	**775.2**	**1063.3**

*Mineral-potential ratings are not available for existing wilderness.

Table 78
Demand for Mineral Materials
(end of the fifth decade)

	Alternatives					
Type of Demand	PRF	CUR	RPA	CEE	AMN	AMB
Road construction (including geothermal access roads) (miles)	87	33	115	77	26	50
Road reconstruction (miles)	750	830	1280	1050	650	850
Supply life (years - if materials were used only for roads)	41	43	27	33	56	42
Geothermal power plants (number)	6	6	6	6	6	6
New developed summer recreaton capacity (M PAOT)	14.0	0	14.1	14.0	0.6	10.7
Adjusted supply life, including other uses (years)	22	31	20	23	39	28

PRF: (Preferred) Opportunities for mineral exploration and development will be relatively high under this alternative, as 90 percent of lands outside of existing withdrawals with high or moderate mineral-potential ratings will be available for mineral entry.

Road reconstruction and construction will deplete the current inventoried supply of mineral materials in 41 years. Additional demand for materials will come from an increase in developed recreation, the construction of six geothermal plants, increased ski area capacity, and other uses. The additional demand could shorten the supply life by as much as 11 years. The emphasis on developed and dispersed recreation will restrict the location and development of replacement sites.

CUR: (Current Program) Opportunities for mineral exploration and development will be relatively high under this alternative, as 90 percent of lands outside of existing withdrawals with high or moderate mineral-potential ratings will be available for mineral entry.

Road reconstruction and construction will deplete the current inventoried supply of mineral materials in 43 years. Additional demand for materials will come from the construction of six geothermal power plants, increased alpine ski area capacity, and other uses. The additional demand could shorten the supply life by as much as 12 years.

RPA: (1980 RPA Program) Opportunities for mineral exploration and development will be highest under this alternative, as all lands outside of existing withdrawals with high or moderate mineral-potential ratings will be available for mineral entry.

Road reconstruction and construction will deplete the current inventoried supply of mineral materials in 27 years. Additional demand for materials will come from an increase in developed recreation, the construction of six geothermal plants, increased alpine ski area capacity, and other uses. The additional demand could shorten the supply life by as much as seven years. The emphasis on developed recreation will restrict the location and development of replacement sites in areas of concentrated use. On the other hand, new areas could be available for mineral material site development as new roads will be allowed in most previously unroaded areas.

CEE: (Maximize Cost-Efficiency) *Opportunities for mineral exploration and* development will be moderate under this alternative, as 76 percent of lands outside of existing withdrawals with high or moderate mineral-potential ratings will be available for mineral entry.

Road reconstruction and construction will deplete the current inventoried supply of mineral materials in 33 years. Additional demand for construction materials will come from an increase in developed recreation, the construction of six geothermal plants, increased alpine ski area capacity, and other uses. The additonal demand could shorten the supply life by as much as 10 years. The emphasis on developed recreation will restrict the location and development of replacement sites in areas of concentrated use. On the other hand, new areas could be available for mineral material site development as new roads will be allowed in most previously unroaded areas.

AMN: (Maximize All Amenities) Opportunities for mineral exploration and development will be relatively low under this alternative, as only 66 percent of lands outside of existing withdrawals with high or moderate mineral-potential ratings will be available for mineral entry.

Road reconstruction and construction will deplete the current inventoried supply of mineral materials in 56 years. The additional demand for construction materials for recreational development, the construction of six geothermal plants, increased alpine ski area capacity, and other uses will shorten the supply life by as much as 17 years. The emphasis on wilderness, scenic values, and dispersed recreation will restrict the location and development of replacement sites.

AMB: (Emphasize Wildlife and Recreation) Opportunities for mineral exploration and development will be moderate under this alternative, as 86 percent of lands outside of existing withdrawals with high or moderate mineral-potential ratings will be available for mineral entry.

Road reconstruction and construction will deplete the current inventoried supply of rock and earth construction materials in 42 years. Additional demand for construction materials will come from an increase in developed

recreation, the construction of six geothermal plants, increased alpine ski area capacity, and other uses. Additional demand could shorten the supply period by as much as fourteen years. The emphasis on recreation and wilderness will restrict the location and development of replacement sites.

MONO BASIN NATIONAL FOREST SCENIC AREA

Introduction

There are no Forest activities subject to the Forest planning process that have the potential to substantially affect scenic, recreational, or scientific values within the Mono Basin National Forest Scenic Area. Planning for the Scenic area, including a complete and detailed analysis of alternatives and environmental consequences, is being conducted outside the Forest planning process. Activities on National Forest lands neighboring the Scenic Area have some potential for indirect impacts. However, less than half of the area boundary adjoins lands under Forest Service control; the rest are administered by the Bureau of Land Management.

Indicators

Management Prescriptions for National Forest lands neighboring the Scenic Area are an indication of the resource management emphasis, including permitted activities and Standards and Guidelines for lands to which the prescriptions are applied.

Assumptions

As the Scenic Area is a congressionally designated area with specific values protected by law, management activities within the area and those on adjoining National Forest land will be managed with consideration for protecting those values.

Consequences Common to All Alternatives

The Management Prescriptions applied to Forest lands adjoining the Scenic Area are virtually the same for all alternatives. The Jeffrey pine forest south of the area boundary will be managed with a primary emphasis on timber production. Shrublands along the southwest boundary will be managed with a primary emphasis on livestock grazing. Lee Vining Canyon will be managed for concentrated recreation use. The steep slopes of Lee Vining Peak will either be recommended for wilderness or managed under the Limited Access prescription.

None of these Management Prescriptions will be likely to generate major impacts on the Scenic Area. As fuelwood gathering is permitted within the Scenic Area, the likelihood of that activity occurring on adjoining timber-emphasis lands will not be a problem. As grazing is currently permitted within the Scenic Area, the potential for livestock drifting into the area from adjoining rangelands will not represent a problem (if grazing were eventually excluded from or limited within the Scenic Area, a conflict could arise). Wilderness, limited access management, and concentrated recreation use are all compatible with Scenic Area values.

PEST MANAGEMENT

Introduction

Forest activities with the greatest potential to influence the pest management program include vegetation management and recreation management.

Consequences of pest-related damage in forested ecosystems are measured in terms of tree mortality, reduced growth, top-kill, and defoliation. Such damage could result in understocking, failure and/or delay of regeneration, reduced site productivity, recreation site degradation, increased numbers of hazardous trees, and other undesirable vegetation changes. Pest-related damage could ultimately have quantitative and qualitative effects on Forest outputs and services.

Indicators

Opportunities to prevent or reduce pest-related damage and the potential need for direct pest control are indicated by the following factors.

1. Timber-related: acres regenerated
2. Recreation-related
   - Developed site use
   - Developed site capacity.

Vegetation management, by creating and maintaining healthy, vigorously growing stands of trees, provides the best opportunity to prevent pest-related damage. In general, increased opportunities to bring timber stands under management (including control of stocking levels and species composition and the timely removal of stressed and/or diseased trees) should reduce the incidence of insect and disease damage.

The appropriate use of regeneration harvest is a means of removing stands that are especially susceptible to, or currently experiencing, unacceptable levels of pest-related damage. As harvested areas are regenerated, the need to protect plantations from animal damage and competing vegetation is offest by the opportunity to maintain pest damage at accepable levels throughout the life of the stand by silvicultural means. Intermediate harvest and selective cutting can also prevent or reduce damage by removing stressed individuals or groups of trees and by reducing the stocking (density) of the stand to biologically appropriate levels.

While the overall health and vigor of forested land is generally greater under timber management than under natural conditions, the value of the timber (and importance of losses to pest-related damage) is also greater where trees are managed for commercial wood production than where they are not. The intensity of pest management in timber will, therefore, be roughly proportional to the number of forested acres regenerated over the planning horizon. Although silvicultural practices will be adequate to maintain pest-related damage at acceptable levels in most cases, direct action against pests could be necessary in specific situations.

Pest control efforts needed to protect visitor health, safety, and enjoyment is roughly proportional to the amount of visitor use in developed recreation

sites. New developed site capacity indicates the addition of new areas not now managed for intensive recreation use and the need to evaluate pest-related hazard situations associated with those new areas.

Assumptions

The Integrated Pest Management (IPM) approach will be used under any alternative. However, the intensity of pest management will vary according to the objectives of each alternative, potentially resulting in different levels of Forest-wide pest damage by alternative.

The likelihood of pest-related damage depends both on climatic and environmental factors outside Forest Service control and on Forest prevention and mitigation activities.

Forest pests are managed primarily through silvicultural treatments which improve the health, vigor, and diversity of the forest. These practices reduce the susceptibility of the forest to pest infestation and resource loss. Direct control is usually limited to areas with high-value improvements such as administrative facilities, areas where public safety is a concern such as developed recreation sites, and plantations where rodent control and site preparation are needed to protect seedlings.

Consequences That Vary by Alternative

Table 79 displays the effects of alternatives on the pest management program.

Table 79
Indicators of Pest Management Intensity
and Pest-related Damage
(by the end of the fifth decade)

	Alternatives					
Indicators	PRF	CUR	RPA	CEE	AMN	AMB
Timber regeneration harvest (M acres)	10.0	40.6	65.0	29.4	16.7	20.8
Developed site recreation use (average annual MRVDs)	2900	1940	2901	2903	1944	2675
New developed site capacity (MPAOT)	14.0	0	14.1	14.0	0.6	10.7
Tentatively suitable timber not managed for maximum health and vigor (M acres)	35.5	21.6	11.5	13.1	48.9	40.9

PRF: (Preferred) The relative intensity of pest management on the Forest will be high due to the moderate amount of timber management and the major increases in developed recreation site capacity and use. The relative

overall amount of pest-related damage will be moderate, as 37 percent of tentatively suitable timber land will not be managed for maximum health and vigor.

Timber-related pest management will be relatively low, as only 10,000 acres will be regenerated in the first 50 years.

The level of pest management required in developed recreation sites in the first decade will be similar to that experienced in 1982. By the end of the fifth decade, pest management needs will have increased in proportion to the 55 percent increase in developed recreation capacity and 57 percent increase in use.

CUR: (Current Program) The overall intensity of pest management on the Forest will be moderate due to the moderate amount of timber management and the decline of developed recreation site use. The overall amount of pest-related damage will be moderate, as 20 percent of tentatively suitable timber land will not be managed for maximum health and vigor.

Timber-related pest management will be moderate, as 40,600 acres will be regenerated in the first 50 years.

The level of pest management required in developed recreation sites for this alternative will be similar to that experienced in 1982.

RPA: (1980 RPA Program) The overall intensity of pest management on the Forest will be high due to the high level of timber outputs and the major increases in developed recreation site capacity and use. The overall amount of pest-related damage will be low, as only 10 percent of the tentatively suitable timber base will not be managed for maximum health and vigor.

Timber-related pest management will be relatively high, as 64,990 acres will be regenerated within the first 50 years.

The level of pest management required in developed recreation sites in the first decade will be similar to that experienced in 1982. By the end of the fifth decade, pest management needs will have increased in proportion to 55 percent increase in developed recreation capacity and 57 percent increase in use.

CEE: (Maximize Cost-Efficiency) The relative intensity of pest management on the Forest will be moderate, due to the moderate amount of timber management and the major increases in developed recreation site capacity and use. The relative amount of pest-related damage will be low, as only 12 percent of the tentatively suitable timber base will not be managed for maximum health and vigor.

Timber-related pest management will be relatively low, as only 29,370 acres will be regenerated in the first 50 years.

The level of pest management required in developed recreation sites in the first decade will be similar to that experienced in 1982. By the end of the fifth decade, pest management needs will have increased in proportion to 55 percent increase in developed recreation capacity and 57 percent increase in use.

AMN: (Maximize All Amenities) The relative intensity of pest management on the Forest will be low due to the low level timber management and the minimal increases in developed recreation site capacity and use. The relative amount of pest-related damage will be moderate to high as 44 percent of the tentatively suitable timber base will not be managed for maximum health and vigor.

Timber-related pest management will be relatively low, as only 16,660 acres will be regenerated in the first 50 years.

The level of pest management required in developed recreation sites will be similar to that experienced in 1982.

AMB: (Emphasize Wildlife and Recreation) The overall intensity of pest management on the Forest will be moderate, due to the moderate amount of timber management and the moderate increases in developed recreation site capacity and use. The overall amount of pest-related damage will be moderate, as 37 percent of tentatively suitable timber will not be managed for maximum health and vigor.

Timber-related pest management will be relatively low, as only 20,840 acres will be regenerated in the first 50 years.

The level of pest management required in developed recreation sites in the first decade will be similar to that experienced in 1982. By the end of the fifth decade, pest management needs will have increased in proportion to 42 percent increase in developed recreation capacity and 44 percent increase in use.

PROTECTION (FIRE MANAGEMENT)

Introduction

Forest activities that can have major effects on the fire protection program include fire management, recreation management, timber management, wilderness designation, road construction, and prescribed fire projects for other resources.

Consequences of these activities are assessed in terms of the expected changes in the number of fires, acres burned, damages, benefits, and costs. Data sources for this analysis include historical fire data and the application of the National Fire Analysis System (USDA Forest Service, 1982), which predicts fire management costs and resource damage under various fire management organizations.

Indicators

While most activities within and adjacent to the Forest have the potential to affect the fire management operation, only the following indicators were used to compare the environmental consequences of the alternatives.

1. Fire management organization
2. Appropriate suppression strategies used
3. Summer recreation use
4. Timber harvest
5. Wilderness recommendations
6. Prescribed fire for other resource management
7. New access roads.

The fire organization has a major effect on the number of fires and acres burned by alternative. The primary elements of the fire organization that vary by alternative are staffing level relative to 1982 and the relative emphasis placed on prevention versus suppression.

Another major potential factor is the combination of fire supression strategies applied. If the control strategy is applied on a Forest-wide basis, overall acres burned will be greater than if the confinement and containment strategies were applied where appropriate.

There are two reasons for this:

1. When individual fires are allowed to burn larger acreage under confinement or containment, the result is reduced fuels accumulation and reduced likelihood of a later, larger fire.

2. When the fire suppression forces are focusing their attention most closely on those lands with the highest fire risk factors and highest resource values, they are more likely to limit the size of fires on those lands (and, consequently, on overall acres burned) than if they were to focus equal attention on all lands, regardless of risk and value considerations.

The amount of recreation use is the third major determinant of wildfire in general, and the primary determinant of human-caused fires. Historic patterns demonstrate that the number of fires and the acreage burned increase in proportion to increased recreation use of the Forest. The need for fire prevention programs and considerations of public safety during suppression actions are additional factors affected by the amount of recreation use.

An increased emphasis on regeneration harvest in suitable timber will result in timber plantations requiring intensive and well planned fire protection. The level of timber harvest and associated vegetation treatment will also determine the fire hazard resulting from fuels accumulation on tentatively suitable timber land (approximately 100,000 acres Forest-wide). Finally, untreated logging debris and tree plantations will affect the rate at which fires spread, fire resistance to control, and the economic value of potential timber losses.

As wilderness designation restricts the use of mechanized equipment for fire management, the mix of fire-protection resources and management options may change as the acres of land under wilderness designation changes.

The amount of prescribed fire for resource objectives such as wildlife habitat improvement, range betterment, and timber site preparation can affect fuel types, resource protection needs, and costs.

Improved road access both increases the risk of human-caused fires and facilitates fire suppression.

Assumptions

The economic analysis of fire management costs and benefits on Inyo National Forest land indicates that the most cost-effective fire organization will entail a reduction relative to the 1982 organization. However, the range of desirable options for fire management on the Forest is limited by the fact that the Forest surrounds, adjoins, or neighbors the communities of Lee Vining, June Lake, Mammoth Lakes, Crowley Lake, Swall Meadows, Paradise Estates, Starlight Estates, Aspendell, and Aberdeen. Much of this community land is developed with valuable improvements. The desire to prevent wildfire originating on National Forest land from damaging or destroying these improvements must be considered, along with economic efficiency, when selecting a fire organization.

Consequences Common to All Alternatives

Although the level of timber harvest varies by alternative, the public fuelwood program and fuel treatment as part of each timber sale are expected to minimize fuels buildup and associated fire hazards; consequently, no fuels treatment for fire hazard reduction in timber is proposed under any alternative. The fire analysis indicates that costs and values related to timber harvest vary little from one alternative to another.

Although wilderness recommendations vary considerably by alternative, their effects on fire management do not vary. Further Planning Areas on the Forest generally rate low in fire risk and resource values. Most of the vegetation is sparsely distributed brush, there are large barren areas, and most of the acreage is located at high elevations low in oxygen and temperature. The effects of different wilderness recommendations on overall recreation use are included in the recreation-use indicator.

The acreage of vegetation treated with prescribed fire for other resource management purposes will not be great enough to significantly affect fuel conditions from a wildfire management point of view under any alternative.

Although improved road access will aid with fire suppression, any gains will be offset by the increases in recreation due to improved access and consequent increases in human-caused fires on more accessible lands.

Lightning accounts for about sixty percent of all wildfires on the Forest. These fires will continue to require some kind of suppression action in all alternatives.

Consequences That Vary by Alternative

The management activities, objectives, and program direction for each alternative are discussed in comparison with base year 1982. The primary sources of variation between alternatives are the fire management program chosen, suppression strategies applied, and amount of recreation use. The primary variable affected will be acres burned by wildfire.

Table 80 displays the effects of alternatives on fire management.

Table 80
Indicators of Consequences on Fire Management

	Alternatives					
Indicators	**PRF**	**CUR**	**RPA**	**CEE**	**AMN**	**AMB**
Fire management program selected:						
-staffing relative to 1982	1982	1982	1982	reduced	1982	1982
-percent prevention	17%	24%	17%	17%	17%	17%
-percent suppression	83%	76%	83%	83%	83%	83%
Suppression strategies applied	all	control only	all	all	all	all
Average annual developed recreation use (M RVDs - 5th decade)	2900	1940	2901	2903	1944	2675
Average annual dispersed recreation use (M RVDs - 5th decade including wilderness)	3225	2290	3217	3279	2601	3101
Average annual acres burned by wildfire (5th decade)	1224	1069	1224	1410	972	1080

PRF: (Preferred) This alternative staffs the fire organization in accordance with the Forest Work Force Plan. Suppression will receive increased emphasis relative to prevention. The suppression strategies of confinement, containment, and control will be applied when and where appropriate. Summer recreation use will increase approximately 80 percent over five decades, accounting for most of the 64 percent increase in acres burned.

CUR: (Current Program) This alternative will select the 1982 fire organization, with a 24 percent to 76 percent relative emphasis on prevention

and suppression. Control will be the only suppression strategy applied. Summer recreation use will increase 16 percent over five decades, accounting for most of the increase in wildfire acres burned. Fire organization and suppression strategies will also be contributing factors. The potential of the Forest to protect the resources of neighboring communities from fires originating on Forest land will be the same as in 1982.

RPA: (1980 RPA Program) This alternative will select the 1982 fire organization in response to community protection needs. The emphasis on suppression will increase relative to prevention. The suppression strategies of confinement, containment, and control will be applied when and where appropriate. Recreation use will increase approximately 80 percent over five decades, accounting for most of the 64 percent increase in wildfire acres burned.

CEE: (Maximize Cost-Efficiency) This alternative will select a fire organization reduced from base year in response to the theme of maximizing cost efficiency. There will be an increased emphasis on suppression relative to prevention. The suppression strategies of confinement, containment, and control will be applied when and where appropriate. The 89 percent increase in wildfire acres burned over base year is associated both with increased recreation use and a reduced fire organization. The protection of neighboring communities from wildfires originating on Forest land will be least effective under this alternative.

AMN: (Maximize All Amenities) This alternative will select the 1982 fire organization in response to community protection needs. Suppression will receive increased emphasis relative to prevention. The suppression strategies of confinement, containment, and control will be applied when and where appropriate. As summer recreation use will increase only 33 percent over five decades, increases in acres burned will be offset somewhat by reductions arising from the application of all appropriate suppression strategies. The net effect will be a 30 percent increase in acres burned relative to 1982.

AMB: (Emphasize Wildlife and Recreation) This alternative will select the 1982 fire organization in response to community protection needs. Suppression will receive increased emphasis relative to prevention. The suppression strategies of confinement, containment, and control will be applied when and where appropriate. Summer recreation use will increase approximately 50 percent over five decades, accounting for most of the 45 percent increase in acres burned.

RANGE

Introduction

Forest activities that have major effects on the range resource include range management, timber management, geothermal development, wildlife management, watershed management, and fire management.

Consequences of these activities are assessed in terms of changes in grazing outputs, acres available for range management, rangeland condition and trend, and effects on range permittees. Data sources for this analysis include range management principles, professional literature, and the Forest data base.

Indicators

1. Range vegetation treatment
2. Wildfire
3. Suitable rangelands on which grazing is reduced, limited, or eliminated due to another primary resource emphasis:
   - Timber management
   - Mule deer winter range
   - Geothermal development
4. Suitable rangelands on which forage production declines due to physical or biological processes:
   - Wet meadows susceptible to accelerated erosion
   - Brush susceptible to decadence
5. Suitable rangelands outside allotments on which grazing is introduced
6. Percent utilization of forage by livestock
7. mountain sheep reintroductions
8. Grazing outputs.

Range vegetation treatments increase overall forage production by type conversion (from less palatable and nutritious types to more palatable and nutritious types) or rejuvenation (stimulating vigorous young growth in place of decadent stands). Vegetation treatments will typically use prescribed burning or mechanical methods.

Wildfire increases forage production on suitable range by rejuvenating shrubby vegetation. The effect is enhanced if the burn is seeded with palatable species.

When suitable rangelands are not managed with a primary emphasis on grazing, the amount of grazing on those lands may be reduced or lost entirely by the fifth decade. For example, rangelands managed primarily for timber production undergo vegetation changes. On the Inyo, the understory of a managed forest is less abundant and represents less desirable forage species than the understory of an unmanaged forest. Consequently, if timber lands that are currently managed primarily for grazing were brought into intensive timber management, grazing outputs will gradually decline to the point of being economically infeasible.

Mule deer and domestic livestock may compete or conflict on deer winter range. If deer winter range is managed with a primary emphasis on deer,

cattle grazing under some alternatives is held to current levels; in other alternatives, livestock are removed entirely from winter range to benefit deer.

Where geothermal plants are built on rangelands, grazing declines in proportion to the amount of land occupied by facilities such as buildings, wellsites, roads, fuelbreaks, pipelines, and equipment staging areas.

Forage production also declines due to physical and biological processes. Wet meadows are the most productive range types on the Forest; however, most of those meadows are damaged or threatened by accelerated erosion. The Forest Watershed Improvement Needs (WIN) plan has identified meadows in need of restoration or protection. The wet meadow acreage subject to erosion at the end of the fifth decade is inversely proportional to the watershed improvement work accomplished in the same time period.

Brush is the other main forage type for livestock on the Forest. Many brush stands are mature and approaching decadence, resulting in a loss of forage production. Decadence can be offset by vegetation treatment for rejuvenation purposes (discussed above). The brush acreage susceptible to decadence at the end of the fifth decade is inversely proportional to the rejuvenation acreage accomplished in the same time period.

Those suitable rangelands that are not in current grazing allotments can be brought into livestock management for an increase in AUMs.

Grazing outputs are proportional to the percent utilization of forage by livestock (e.g., 60 percent utilization represents a one-fifth increase in forage over 50 percent utilization).

Grazing outputs are primarily a function of acres available and range condition.

Assumptions

Virtually all of the suitable range on the Forest (388,848 acres of public land and 10,448 acres of waived private land) is currently contained in range allotments and managed for livestock grazing. The remaining 6,600 acres of suitable range are not grazed due to the difficulty of distributing livestock to small, scattered units; inability to control drift; difficult access; and lack of water.

Potential competition between domestic livestock, recreation pack and saddle stock, and wildlife are addressed by controlling seasons of use, livestock distribution, and utilization standards that provide at least the minimum of reserve forage even under maximum livestock-management scenarios.

Consequences Common to All Alternatives

The amount of grazing in existing wilderness will continue at current levels under all alternatives. Although opportunities to increase grazing are lost in Further Planning Areas recommended for wilderness, those opportunities are not great enough to make noticeable differences in the overall grazing program by alternative.

Although watershed improvement will actually increase forage production in damaged meadows as well as preventing further deterioration, the majority of wet meadows treated are in wilderness. As grazing in wilderness is limited to current levels, outputs will not increase with increased forage; they will, however, drop with continuing loss of forage. The opportunity to increase grazing in wet meadows outside of wilderness is not great enough to noticeably affect Forest-wide outputs differently by alternative.

The effects of geothermal development on livestock grazing will be the same for all alternatives. Three-thousand eight-hundred acres will be removed from the suitable range base for this purpose.

Consequences that Vary by Alternative

Table 81 displays the effects of the alternatives on domestic livestock grazing. Most of the grazing outputs in this table represent 50-year averages; only total outputs are also displayed in terms of the projected fifth decade average taken by itself.

Table 81
Indicators of Effects on Livestock Grazing
(by the End of the Fifth Decade)

Indicators	Alternatives					
	PRF	CUR	RPA	CEE	AMN	AMB
Base year 1982 outputs (M AUMs)	41.4	41.4	41.4	41.4	41.4	41.4
Range vegetation treatment						
-Total (M acres)	42.9	27.4	76.6	62.4	34.8	41.5
-Effect on outputs (M AUMs)	+7.3	+4.4	+12.5	+10.3	+5.9	+7.1
Suitable rangelands burned by wildfire						
-Total (M acres)	9.1	10.6	9.1	12.9	8.3	8.8
-Effect on outputs (M AUMs)	+1.1	+1.3	+1.1	+1.6	+1.0	+1.1
Rangelands managed for timber production						
-Total (M acres)	21.9	21.4	43.0	10.0	6.2	0
-Effect on outputs (M AUMs)	-1.3	-1.3	-2.7	-0.6	-0.4	0
Rangelands occupied by geothermal energy plants						
-Total (M acres)	3.8	3.8	3.8	3.8	3.8	3.8
-Effect on outputs (M AUMs)	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
Management of mule deer winter range (cattle vs. deer)						
-Total (M acres)	0	0	96.4	0	96.4	96.4
-Effects on outputs (M AUMs)	0	0	+1.9	0	-9.6	-9.6
Wet meadows subject to accelerated erosion						
-Total (M acres)	6.4	21.5	13.6	0	0	0
-Effect on outputs (M AUMs)	-1.1	-3.6	-2.3	0	0	0
Brush in allotments subject to maturation						
-Total (M acres)	78.6	71.6	71.6	75.3	79.0	67.7
-Effect on outputs (M AUMs)	-1.6	-1.4	-1.4	-1.5	-1.6	-1.4
Suitable rangelands added to allotments						
-Total (M acres)	0	0	6.6	6.6	6.6	6.6
-Effects on outputs (M AUMs)	0	0	+0.4	+0.4	+0.4	+0.4
60 percent utilization applied						
-Total (M acres)	0	0	257.0	0	0	0
-Effects on outputs (M AUMs)	0	0	+5.1	0	0	0
Mountain sheep reintroductions						
-Effects on outputs (M AUMs)	-0.6	-0.6	0	0	-0.6	-0.6
Net Change from 1982 (M AUMs)	0	-1.6	+14.8	+10.5	-4.7	-3.4
Total outputs						
(M AUMs: 50-year average)	41.4	39.8	55.6	51.2	36.1	38.0
(M AUMs: fifth decade)	41.4	39.1	55.6	46.5	35.1	39.4

PRF: (Preferred) Grazing outputs will remain at current levels. There will be some loss of grazing potential because of timber management, geothermal development, increasing decadence of range vegetation, a loss of wet meadows due to accelerated erosion, and the reintroduction of mountain sheep.

The overall condition and trend of rangelands will improve on the 52,000 acres of treated or burned brush and the 23,500 acres of treated wet meadow. Condition and trend will remain static or decline elsewhere due to increasing decadence or accelerated erosion.

As many as nine existing permittees could be affected by reduced grazing capacity on allotments associated with timber and geothermal development. Although some of the affected permittees could be moved to areas of increased forage, others could be put out of business by the change. The overall increase in forage will allow some existing permittees to be relocated and others to expand.

CUR: (Current Program) Grazing outputs will drop 6 percent below the 1982 base year level, over 50 years. Reductions in outputs will be due to timber management, geothermal development, wet meadow erosion, brush decadence, and mountain sheep reintroduction. Overall losses will be offset to some degree, primarily by minor gains from vegetation treatment and wildfire. Opportunities to implement an extensive vegetation treatment program and to fully implement the watershed improvement plan for wet meadows will be limited by the budget restrictions of this alternative.

Range condition and trend will decline as efforts to reduce livestock use in response to reductions in capacity will fall behind range condition analysis. As many as ten existing permittees could be affected by reduced grazing capacity on allotments associated with timber, geothermal and wet meadow erosion. As few, if any, of the affected permittees could be relocated, most will be put out of business by the change. The overall drop in range capacity will result in fewer permittees; any expansion of existing operations could result only where other operations went out of business.

RPA: (1980 RPA Program) Grazing outputs will increase 34 percent over the 1982 base year level by the end of the fifth decade. The President's target of a 46 percent increase over the specified base level of 38,500 AUMs will be met, and the 1980 RPA target of 44,500 AUMs will be exceeded.

Increases in grazing will result primarily from vegetation treatment, including rejuvenation of bitterbrush and widespread conversion of big sagebrush, pinyon pine, and noncommercial Jeffrey pine to desirable forage types; the application of a 60 percent utilization standard in place of 50 percent utilization; and a reduction of deer habitat capability on key winter range. Smaller gains will come from other sources. Overall increases will be offset by the loss of grazing to timber management, geothermal development, wet meadow erosion, and range decadence.

The overall condition and trend of rangelands will improve on the 85,700 acres of treated or burned brush and the 9,900 acres of treated wet meadow.

Condition and trend will remain static or decline elsewhere due to increasing decadence or accelerated erosion.

As many as ten existing permittees could be affected by reduced grazing capacity on allotments associated with timber, geothermal development, and wet meadow erosion. Although some of the affected permittees could be moved to areas of increased forage, others could be put out of business by the change. The overall increase in forage will allow some displaced permittees to be relocated, others to expand, and perhaps some new permittees to be added.

CEE: (Maximize Cost-Efficiency) Grazing outputs will increase 12 percent above the 1982 base year over 50 years. Most of that increase will result from vegetation treatment in bitterbrush and big sagebrush. Additional gains will come from other sources. Overall increases will be offset by losses of grazing due to timber management, geothermal development, and range decadence.

The overall condition and trend of rangelands will improve on the 75,300 acres of treated or burned brush and the 23,500 acres of treated wet meadow. Condition and trend will remain static or decline elsewhere due to increasing decadence or accelerated erosion.

As many as seven existing permittees could be affected by reduced grazing capacity on allotments associated with timber and geothermal development. Although some of the affected permittees could be moved to areas of increased forage, others could be put out of business by the change. The overall increase in forage will allow some existing permittees to be relocated, others to expand, and perhaps new permittees to be added.

AMN: (Emphasize All Amenities) Grazing outputs will decline 15 percent from the 1982 base year level over fifty years. Most of that loss will result from removing cattle from mule deer winter range; the remainder will be lost to timber and geothermal management, range decadence, and mountain sheep reintroduction. Overall losses will be offset somewhat due gains from range vegetation treatment and other sources.

The overall condition and trend of rangelands will improve on the 43,100 acres of treated or burned brush and the 23,500 acres of treated wet meadow. Condition and trend will remain static or decline elsewhere due to increasing decadence or accelerated erosion.

As many as fourteen existing permittees could be affected by reduced grazing capacity. Few, if any, displaced permittees could be relocated, as forage improvements will be scattered and absorbed by permittees on affected allotments; consequently, most of the displaced permittees will go out of business.

AMB: (Emphasize Wildlife and Recreation) Grazing outputs will drop five percent below the 1982 base year level over fifty years. Most of that loss will result from removing cattle from deer winter range. The remaining

losses will be associated with geothermal development, range decadence, and mountain sheep reintroduction. Overall losses will be offset somewhat by vegetation treatment, wildfire, the maintenance of current grazing levels in suitable timber, and other minor sources.

The overall condition and trend of rangelands will improve on the 50,300 acres of treated or burned brush and the 23,500 acres of treated wet meadow. Condition and trend will remain static or decline elsewhere due to increasing decadence or accelerated erosion.

As many as seven existing permittees could be affected by reduced grazing capacity on allotments associated with deer winter range and geothermal development. Few, if any, displaced permittees could be relocated, as forage improvements will be scattered and absorbed by permittees on affected allotments; consequently, most of the displaced permittees will go out of business.

RECREATION

Introduction

Forest activities that have major effects on the recreation resource include recreation management, energy development, timber management, and wilderness management.

Consequences of these activities are assessed in terms of changes in the capacity for developed and dispersed recreation, changes in the amount of various types of recreation use, and changes in the number of acres available for different types of recreation. Data sources for this analysis include the Recreation Information Management (RIM) system, the recreation demand analysis for Forest planning, Forest inventories of potential recreation sites, preliminary studies of potential ski areas, and the Forest data base.

Recreation has been divided into four categories to facilitate the discussion of consequences: developed recreation, alpine skiing, dispersed recreation, and the Recreation Opportunity Spectrum.

Indicators

1. Developed Recreation
   - Developed recreation site capacity
   - Developed recreation use.

2. Alpine Skiing
   - Acres available for ski area development
   - Developed ski area capacity
   - Skiing use.

3. Dispersed Recreation
   - Acres available
   - Dispersed recreation use
   - Acres and miles of roads and trails available only for OHV use.

4. Recreation Opportunity Spectrum (ROS)
   - Forest-wide distribution of ROS classes
   - Change in ROS class distribution.

Developed recreation site capacity is measured by the Persons-At-One-Time (PAOT), the number of people a facility is designed to serve. Recreation use is measured in recreation visitor days (RVDs) estimated use. Discussions of developed recreation do not include alpine skiing, as skiing is addressed separately. Developed alpine ski area capacity is measured as Skiers-At-One-Time (SAOT); skiing use is measured in Recreation Visitor Days (RVDs). Acres available represent the total acres of existing and potential alpine ski areas, including at least the full development of Mammoth Mountain and June Mountain and at most the Sherwin Bowl, Mammoth Knolls, Minaret Summit, San Joaquin, and White Wing potential ski areas.

Dispersed recreation areas are expressed in terms of the acres available in each Recreational Opportunity Spectrum (ROS) class. Definitions for the ROS classes are found in Chapter VIII, Glossary. Recreation use is measured in (RVDs). Miles of OHV roads and trails are not displayed because the Plan requires that a new updated Motor Vehicle Use Plan be prepared.

The type of developed and dispersed recreation opportunities vary depending upon the Recreation Opportunity Spectrum (ROS) class of the lands on which they are found. The seven ROS classes are Urban (U), Rural (R), Roaded Modified (RM), Roaded Natural (RN), Semi-Primitive Motorized (SPM), Semi-Primitive Non-Motorized (SPNM), and Primitive (P). The consequences of alternatives were measured by the percent distribution of Forest lands by ROS class.

The projected changes in ROS Class acreage over time applied the following assumptions:

1. New alpine ski area development will represent an increase in the Rural ROS class.

2. New recreation developments and new concentrated recreation areas will represent an increase in the Roaded Natural, Roaded Modified, or Rural ROS classes.

3. New road access for timber management or mineral development will represent an increase in the Roaded Natural ROS class.

4. Acres of recommended wilderness or motor vehicle closure will represent an increase in the Primitive or Semi-Primitive Non-Motorized ROS classes.

The following tables display the consequences of alternatives on Forest recreation opportunities.

Table 82
Indicators of Consequences on Developed Recreation
(Public and Private) (Does not include alpine skiing)

	Alternatives					
Indicators	PRF	CUR	RPA	CEE	AMN	AMB
Developed site capacity (M PAOT)						
Base Year 1982	25.5	25.5	25.5	25.5	25.5	25.5
Decade 1	25.5	25.5	25.5	25.5	25.5	25.5
Decade 2	30.7	25.5	30.9	30.1	25.1	30.8
Decade 3	36.5	25.5	36.5	36.5	26.1	36.2
Decade 4	39.5	25.5	39.6	39.5	26.1	36.2
Decade 5	39.5	25.5	39.6	39.5	26.1	36.2
Developed recreation site use (M RVDs)						
Base Year 1982	1849	1849	1849	1849	1849	1849
Decade 1	2229	1944	2325	2423	1944	2099
Decade 2	2517	1944	2708	2903	1944	2099
Decade 3	2708	1944	2900	2903	1944	2386
Decade 4	2900	1940	2900	2903	1944	2483
Decade 5	2900	1940	2901	2903	1944	2675

Table 83
Forest Lands Available for Dispersed Recreation
by ROS Class (by the end of the fifth decade) (M acres)

		Alternatives					
ROS Class	1982	PRF	CUR	RPA	CEE	AMN	AMB
Primitive	870.6	867.1	867.1	836.2	865.7	869.8	867.8
Semi-Primitive Non-Motorized	392.6	404.9	402.7	380.6	418.9	490.4	442.2
Semi-Primitive Motorized	189.2	215.4	238.1	230.7	183.8	152.7	195.9
Roaded Natural	383.6	335.6	319.1	381.0	343.1	325.7	308.5
Roaded Modified	35.1	47.0	43.3	39.8	48.1	36.6	51.5
Rural	11.6	13.1	13.0	14.3	22.0	10.2	16.5
Urban	2.0	1.6	1.4	2.1	3.1	1.3	2.3

Table 84
Changes in ROS Class Distribution
by the end of the fifth decade (M acres)

		Alternatives					
ROS Classes	1982*	PRF	CUR	RPA	CEE	AMN	AMB
Primitive (P)	870.6	-3.5**	-3.5	-34.4	-4.9	-0.8	-2.8
Semi-Primitive Non-Motorized (SPNM)	392.6	+12.3	+10.1	-12.0	+26.3	+95.8	+49.6
Semi-Primitive Motorized (SPM)	189.2	+26.2	+48.9	+41.5	-5.4	-36.5	+6.7
Roaded Natural (RN)	383.6	-48.0	-64.5	-2.6	-40.5	-57.9	-75.1
Roaded Modified (RM)	35.1	+11.9	+8.2	+4.7	+13.0	+1.5	+16.4
Rural (R)	11.6	+1.5	+1.4	+2.7	+10.4	-1.4	+4.9
Urban (U)	2.0	-0.4	-0.6	+0.1	+1.1	-0.7	+0.3

* 1982 acreage is adjusted to reflect the California Wilderness Act of 1984
** Acreage changes are relative to 1982

Consequences Common to All Alternatives

Developed Recreation: The quality of the recreational experience and the opportunities provided by developed facilities are, in part, related to specific attractions and desirable site characteristics. Under all alternatives, the quality of the experience and the number and variety of recreational opportunities are greatest in existing concentrated recreation areas where streams, lakes, spectacular scenery, and screening vegetation are most abundant. Although attractions and opportunities in the Owens River potential concentrated recreation area are similar to existing areas, the Buttermilk and Parker Lake-Sawmill Canyon areas rate lower on those factors.

Outside of concentrated recreation areas, attraction and recreation opportunity levels range from moderate in areas with screening vegetation to low in areas of open brush. There are few, if any, water-related attractions. Although many potential developed sites with limited attractions and poor site characteristics could be added to the inventory, use levels in such sites will be extremely low. The BLM operates many campgrounds on such sites. Those campgrounds are virtually vacant most of the year. By the third to fifth decades, as recreational equipment, technology, and user interests change, these uninventoried potential sites could become more desireable. If so, they should be added to the inventory at that time.

It is expected that increasing numbers of recreationists will recreate outside of peak use seasons due to the development of motorhomes and campers designed for year-round use. As seasons of use lengthen, the demand for

year-round operation of many overnight facilities will increase. Extended seasons could provide for considerable additional use without greatly expanded site capacity. This opportunity will be available for all alternatives under which facilities and services are provided at standard. Below-standard operation will entail the shortening of use seasons.

Developed sites neighboring the Mammoth Lakes and June Lake communities will become more valuable for day use and open space as ski areas develop, communities increase in size, and summer community occupancy rates increase. Recreation outputs and opportunities related to overnight facilities will decline in proportion to increased day use.

Geothermal development in Lease Blocks I and II will not directly affect any existing recreation sites. However, the attractiveness and use levels of sites near geothermal developments will be expected to drop due to the presence of large industrial facilities in the area.

New hydroelectric developments will also affect developed recreation opportunites and use, even though none of the existing proposals will actually eliminate recreation sites. The recreation loss associated with hydroelectric development could be even greater than that associated with geothermal, due to the popularity of water-oriented recreational facilities. Hydroelectric projects reduce stream flows, affecting fisheries, scenic values, water play, and other riparian area-related recreational values. The likelihood of new hydroelectric development is common to all alternatives.

Alpine Skiing: In all alternatives the approved development plans for Mammoth Mountain and June Mountain will be implemented. These plans call for Mammoth Mountain to be developed to a capacity of 24,000 SAOT and June Mountain to a capacity of 7,000 SAOT. Any additional developed beyond these levels will require a cumulative impacts study that will be outside the purview of this Plan.

Dispersed Recreation: In all alternatives, the ability of the Inyo National Forest to meet the demand for dispersed recreation is closely linked to meeting the demand for developed recreation. The amount of Forest-wide dispersed recreation use is roughly proportional to the amount of developed overnight capacity on both public and private lands in the area. Only wilderness use and hunting are mostly independent of developed overnight facilities, as wilderness users and hunters typically camp in dispersed areas.

The general types of dispersed activities and opportunities will not change between alternatives. All alternatives will offer a full range of activities in balanced proportions with no one type of activity dominating the others. Although some activities may increase considerably, they will not exclude or substantially reduce opportunities for other activities.

Most of the changes that will occur under a given alternative will affect only small acreages representing a fraction of the total Forest land base. For example, a five-fold increase in nordic skiing over current levels on 10,000 acres will not affect the activities taking place on the other 99.5 percent of the Forest. In addition, as only 30,000 acres of suitable timber lie in currently unroaded areas, less than 2 percent of the Forest will be

affected by improved access for timber management, even under alternatives that maximized timber production. Major changes in acreage in the different ROS classes, and thus in dispersed activities and opportunities Forest-wide, are not likely to change substantially over the next 50 years.

Driving for pleasure will be expected to increase a minimum of 400,000 to 500,000 RVDs under all alternatives in response to community growth and the widening of U.S. 395, facilitating travel between the Los Angeles metropolitan area and the Forest.

The combination of recreational activities and opportunities in concentrated recreation areas will remain the same under all alternatives. Water-oriented activities will continue to be central for most summer recreationists.

Nordic skiing opportunities will be expected to increase a minimum of 140,000 RVDs under all alternatives as the demand for that activity expands. Additional increases in demand will be associated with increased alpine ski area capacity, due to the nordic skiing associated with the attraction of more alpine skiers to the Forest.

Opportunities for wilderness recreation on the Forest will not come close to meeting demand under any alternative, as the management of wilderness within capacity limits places a ceiling on use that is unrelated to demand, and as new wilderness areas will not have the attractions or the capacity to contribute substantially to recreation opportunities. The amount of recreation use varies very little by alternative, even though the acreage proposed for wilderness varies widely.

Geothermal development will eliminate dispersed recreation use on the acres actually occupied by facilities under any alternative. In addition, a far greater area could be impacted, depending on the location of developments, the road system designed, the configuration of pipelines and powerlines, and the security measures deemed necessary by industry. The effects of geothermal development in Lease Blocks I and II north and east of Mammoth will be the same for all alternatives.

New hydroelectric development could also affect dispersed recreation under any alternative. The effects could be even greater than the effects of geothermal development, as hydroelectric plants will conflict with popular water-oriented recreation. Sections of stream affected by hydroelectric projects will no longer be considered concentrated recreation areas, due to the reduced density of use levels that will result. The likelihood of such development is considered common to all alternatives.

Recreation Opportunity Spectrum (ROS): The demand for recreation opportunities in the primitive (primarily wilderness) ROS class will not be met under any alternative. The supply available is limited by established wilderness capacity limits and the limited potential of Further Planning Areas on the Forest to provide for additional use. The management of wilderness within capacity limits helps to ensure a high quality experience for the user and reduces the overcrowding that often leads to resource degradation. Such management also, however, limits the amount of use and the ability of the Forest to meet wilderness recreation demand.

The Forest will not meet the demand for recreation in the Rural ROS class (primarily alpine skiing) under any alternative due to the management of alpine ski areas within established capacity limits to ensure a quality experience for the skier.

The supply of Semi-Primitive Motorized and Roaded Natural opportunities will exceed demand under all alternatives. The demand for activities in these ROS classes is limited by the availability of overnight lodging, both public and private, to provide a population base for dispersed activities.

Sixty-six percent of the Inyo is already classified as Primitive or Semi-Primitive Non-Motorized; another 11 percent is classified Semi-Primitive Motorized. There will be little change in these ROS classes Forest-wide over 50 years, even under alternatives with little or no wilderness.

The distribution of lands in the various ROS classes will generally shift in the direction of more development under most alternatives. ROS shifts toward to less development will be more difficult to achieve. It is unlikely, for example, that a given area will change from Rural to Roaded Natural, or Roaded Natural to Semi-Primitive Motorized within five decades without specific administrative controls. On the other hand, Semi-Primitive Motorized acres will shift to the Semi-Primitive Non-Motorized ROS class as a result of wilderness designation or motor vehicle closure.

Consequences That Vary by Alternative

PRF: (Preferred)

Developed Recreation: This alternative will provide a wide range of high-quality developed recreation activities and opportunities. The user could expect well-maintained facilities in both rehabilitated and newly constructed sites. The density of use in concentrated recreation areas will increase. Developed site operating seasons will be longer, and a greater variety of sites will be available. The projected demand for developed recreation will be met during the first through third decades. 81 percent of demand will be met by the fifth decade, with approximately 2.9 million developed site RVDs. Approximately 90 percent of inventoried potential sites will have been developed.

The opportunities provided will shift from the current campground-dominated situation to a more balanced one with additional day use facilities, especially interpretive sites. Most new developments will still occur in the public sector. However, privately developed recreational vehicle park opportunities and nordic ski resort opportunities will increase on the Forest. All existing sites will be brought to standard service levels in the first two decades. Sixty-six percent of new facilities will be located in existing concentrated recreation areas, 16 percent will be built in newly created concentrated recreation areas, and 18 percent will be built elsewhere on the Forest.

Developed recreation in existing concentrated recreation areas will not be affected by other resource activities, except that recreation developments will have to meet standards for water quality and riparian area protection. In the proposed concentrated recreation areas for the Owens River and the

Walker Lake-Sawmill Canyon areas, existing grazing allotment direction will determine the amount, location, and design of recreational facilities. Recreation sites located in key deer habitat will be subject to seasonal closures.

Dispersed Recreation: The quality of dispersed recreation activities and opportunities will increase due to a full complement of well-maintained facilities which will disperse use, lessen concentrations of people, and reduce adverse impacts on sensitive riparian areas. Users will find moderate levels of control and enforcement to reduce conflicts between activities. OHV users will find less freedom of movement because of greater restrictions on travel, especially on lands adjacent to communities. Fishing opportunities will increase slightly, while hunting opportunities will decline slightly under this alternative.

The projected demand for dispersed recreation will be met in the first through the third decades, while only 76 percent of demand will be met in the fifth decade with 2.4 million dispersed non-wilderness RVDs.

An 81 percent increase in dispersed RVDs in concentrated recreation areas will be facilitated by the addition of 180 miles of trail, which will encourage a broader range of activities and opportunities.

Dispersed use on open-roaded lands will increase 182 percent over 50 years. Vehicle-based opportunities will increase where new timber access roads entered the lands east of San Joaquin Ridge. Dispersed recreation use in unroaded areas will increase slightly due to local community growth.

OHV opportunities will be defined in the update of the 1977 Interagency Motor Vehicle Use Plan. OHV opportunities on the Forest are managed under this plan, developed by the Bureau of Land Management, Department of Water and Power of the City of Los Angeles and the Forest. There will be extensive public participation in the update of this Plan, which will display opportunities for both OHV and OSV use.

All dispersed recreation areas will be managed at standard levels of operation. Trails and trailheads will be maintained to levels identified in trail maintenance plans.

Recreation Opportunity Spectrum: Demand will be met and exceeded in the SPM and RN classes, and will nearly be met in the SPNM and RM classes throughout the next fifty years. Opportunities in the Primitive and Rural ROS classes, on the other hand, will fall far short of meeting demand. Wilderness in the Primitive class and alpine skiing in the Rural class will both be highly regulated under this alternative to ensure a quality recreational experience. The development of additional trails for hiking outside wilderness on SPNM lands and nordic skiing on RN lands will provide additional opportunities to offset use limitations elsewhere.

ROS class acreage will increase mainly in the SPNM and SPM portion of the spectrum because of additional wilderness and areas managed with an emphasis on primitive recreation opportunities. An increase in concentrated recreation areas and some additional ski area development will represent substantial increases in roaded modified and Rural ROS classes with

corresponding reductions in Roaded Natural acreage. The total acres shifting between ROS classes will represent 5.5 percent of the Forest.

CUR: (Current Program)

Developed Recreation: This alternative will emphasize overnight camping. Day use facilities such as interpretive sites, trails, parking, and information signs will be minimal. User densities will remain at current levels, but user dissatisfaction will increase as sites deteriorated. Use of many facilities will be restricted to peak seasons only.

Developed recreation outputs will be maintained near current levels throughout the planning horizon. In the fifth decade, only 54 percent of estimated demand will be met with 1.9 million developed site RVDs. Approximately 59 percent of the total potential supply will have been developed, with no new construction over the planning horizon.

Management of Forest Service campgrounds will continue at low-standard levels for most sites. Facilities will deteriorate to the point that maintenance could not provide needed repairs. The quality of services, facilities, and site condition will decline to unsatisfactory levels. Use will be expected to drop below existing levels in the more poorly maintained sites. A minimal rehabilitation program will keep facilities open while preventing excessive resource damage.

Most resorts and commercial uses will remain, with a slight increase in private RV facilities offsetting the declining use of public sites to some degree.

The management of existing developed sites will not be affected by other resource management objectives except for the need to meet water quality, riparian area, and visual quality standards.

Dispersed Recreation: The quality of dispersed recreation activities will decline. Lack of controls and facilities will lead to overcrowding, conflicts between activity groups, deterioration of sensitive riparian zones, and user inconvenience. Hunting and fishing opportunities will decline with deteriorating habitat capability for game species.

Dispersed RVD outputs will increase slightly in this alternative, meeting demand through the first decade. This increase will result from increased nordic skiing and driving for pleasure, though even those opportunities will be provided at low-standard levels. By the fifth decade, only 49 percent of projected demand will be met, with approximately 1.6 million non-wilderness dispersed RVDs.

By the fifth decade, dispersed recreation use in concentrated recreation areas will drop approximately 20 percent due to the deterioration of developed sites. No new non-wilderness trails will be built under this alternative.

Dispersed recreation use in roaded areas of the Forest will increase about 65 percent due to the upgrading of U.S. 395 and the building of new timber roads into the now-unroaded Monache and San Joaquin areas.

The opportunities available to OHV users will basically remain unchanged, except that 107,600 additional acres in new wilderness will add some closed areas both summer and winter. Timber management in Monache will reduce the opportunity for OHV recreation in that area. Illegal OHV use will probably increase over time with a lack of effective law enforcement. Physical and visual disturbances, conflicts with other users, and general polarization of feelings and loss of enjoyment by other user groups will result, especially on lands adjacent to local communities.

Nordic skiing will increase 115 percent by the fifth decade. Approximately 325 miles of marked trail and tracks will provide for 366,000 RVDs. All nordic ski trails and facilities will be developed privately under special use permit. Most will be located in the Mammoth area.

Recreation Opportunity Spectrum: Demand will be met and exceeded in the SPM and RN classes, but opportunities in neither the SPNM or RM classes will meet demand. Some overcrowding will be experienced during peak use periods in the RM class. Both Primitive and Rural class opportunities will fall far short of meeting demand due to capacity limitations placed on wilderness use and alpine skiing. However, as wilderness quotas will not be enforced with reduced services, the quality of the Primitive recreation experience will decline. There will be no additional trails built in other ROS classes to offset crowding in the Primitive class.

ROS class acreage in SPNM, SPM, and RM will increase. The largest increase in SPM will result from the large number of acres in the White, Inyo, and Excelsior Mountains that will be open to primitive roading or motorized trail developments. The slight increase in RM acres will not result in increased use, as there will be no new recreation developments. The Rural class will increase in response to ski area development. The total acres shifting between classes will represent 7.2 percent of the Forest.

RPA: (1980 RPA Program)

Developed Recreation: This alternative will provide a wide range of high-quality developed recreation activities and opportunities. The user could expect well-maintained facilities in both rehabilitated and newly constructed sites. The density of use in concentrated recreation areas will increase. Developed site operating seasons will be longer, and a greater variety of sites will be available. There will, however, be potential for reduced recreational quality in forested settings due to a heavy emphasis on timber production. Conflicts and user dissatisfaction will focus on the suitable timber lands between the Mammoth Lakes and June Lake Loop recreation areas.

The projected demand for developed recreation will be met during the first through third decades. 81 percent of demand will be met by the fifth decade, with approximately 2.9 million developed site RVDs. Approximately 90 percent of inventoried potential sites will have been developed.

The opportunities provided will shift from the current campground-dominated situation to a more balanced one with additional day-use facilities, especially interpretive sites. Most new developments will still occur in the public sector. However, privately developed RV parks and nordic ski resorts will increase on the Forest. All existing sites will be brought to standard service levels in the first two decades. Fifty percent of new facilities will be located in existing concentrated recreation areas, 11 percent will be built in newly created concentrated recreation areas, and 31 percent will be built elsewhere on the Forest. The overall quality of developed sites will be slightly lower than under the PRF alternative, as more of the new sites will be located away from water.

Although developed sites in the existing Deadman and Inyo Craters concentrated recreation areas will be maintained, there will be no expansion or development of potential sites in those areas due to the heavy emphasis on timber management. Opportunities for full development of the potential Owens River concentrated recreation area will also be foregone.

The expansion of alpine ski area development in the Mammoth area will result in a community more than twice the current size. Much more day use will be expected in developed sites during the summer, as the community continued to develop as a full four-season destination resort. Direction for existing grazing allotments in the proposed Buttermilk, Owens River, and Walker Lake-Sawmill Canyon concentrated recreation areas will determine the amount, location, and design of recreation facilities in those areas.

Dispersed Recreation: The quality of dispersed recreation activities and opportunities will increase due to a full complement of well-maintained facilities which will disperse use, lessen concentrations of people, and reduce adverse impacts on sensitive riparian areas. Users will find moderate levels of control and enforcement to reduce conflicts between activities. OHV users will find more freedom of movement due to a increase in open areas and in open roads and trails. Fishing and hunting opportunities will decline considerably under this alternative, due to impacts on game species by intensive commodity production.

The projected demand for dispersed recreation will be met in the first through the third decades, while only 76 percent of demand will be met in the fifth decade with 2.4 million dispersed non-wilderness RVDs.

An 81 percent increase in dispersed RVDs in concentrated recreation areas will be facilitated by the addition of 180 miles of trail, which will encourage a broader range of activities and opportunities. A timber management emphasis will eliminate the Deadman and Inyo Crater concentrated recreation areas, reducing RVDs in those areas.

Dispersed use in the roaded portions of the Forest will increase by 210 percent during the next 50 years, the highest of any alternative. Vehicle-based opportunities will increase where new timber access roads entered the lands east of San Joaquin Ridge and the Monache area. Dispersed use of unroaded lands will increase due to day use associated with local community growth.

Nordic skiing opportunities will be expected to expand, with a 200 percent increase in use by the fifth decade. Approximately 450 miles of marked trail and track will be in use, accommodating 382,000 RVDs.

Summer open-OHV areas will increase by 62,200 acres to include the north end of the Inyo mountains and part of the Excelsior range. The portions of the Jeffrey pine forest currently open will become restricted to protect plantations. The closed areas will remain the same as the current OHV plan. The expected growth in Mammoth Lakes and other local communities will trigger an increase in OHV activities. OHV use could become a major summertime recreational activity, requiring additional Motorized trails and activity areas. Winter open-OHV areas will be reduced by more than 40,000 acres to reduce conflicts with developed ski areas.

All aspects of dispersed recreation will be administered at standard levels of operation.

Recreation Opportunity Spectrum: Demand will be met or exceeded in the SPM and RN classes, but will not be met in any other ROS class, as capacity will be reached in all cases before the fifth decade. Primitive and SPNM opportunites in particular will be affected by the lack of additional wilderness and the low level of acreage retained for Non-Motorized forms of recreation. The greatest potential will be found for activities relating to the Roaded Natural ROS class, as use of lands in that class will not conflict with intensified timber management. Increased hiking trails in RN and SPM classes will help offset the limited capacity in Primitive and SPNM, but user conflicts could occur with greater frequency due to increased density of use.

Timber management will cause a reduction in RM ROS class acreage. Use on these acres will not be transferred to non-timbered RN acres, as most of the activities and uses in RN are day-use and dispersed rather than developed.

The greatest increase in acres will be found in the SPM class, with small additions in the RM and R classes. The addition of acres to Rural, though small, will represent large increases in RVDs, as alpine skiing will be the major activity represented on those lands. The greatest losses in acreage will be found in the Primitive and SPNM classes, as no new wilderness is added and because large unroaded areas in the White and Inyo Mountains and the Coyote plateau will be made available for increased vehicle-based opportunites. The major shift Forest-wide will be towards the Rural end of the spectrum. However, only 5.2% of the total Forest acres will change classes.

CEE: (Maximize Cost-Efficiency)

Developed Recreation: This alternative will provide a wide range of high-quality developed recreation activities and opportunities. The user could expect well-maintained facilities in both rehabilitated and newly constructed sites. The density of use in concentrated recreation areas will increase. Developed site operating seasons will be longer, and a greater variety of sites will be available. The Mammoth and June Lake areas will be much more crowded, and users will be subject to more controls and regulations to reduce conflicts between activity groups.

The projected demand for developed recreation will be met during the first through third decades. 81 percent of demand will be met by the fifth decade, with approximately 2.9 million developed site RVDs. Approximately 90 percent of inventoried potential sites will have been developed.

The opportunities provided will shift from the current campground-dominated situation to a more balanced one, with additional day-use facilities, especially interpretive sites. Most new developments will still occur in the public sector. However, privately developed RV parks and nordic ski resorts will increase on the Forest. The type of use in the Mammoth and Deadman areas will shift markedly toward day use and away from overnight use in response to the greatly increased summer population of Mammoth Lakes.

All existing sites will be brought to standard service levels in the first two decades. Seventy-one percent of new facilities will be located in existing concentrated recreation areas, 16 percent will be built in newly created concentrated recreation areas, and 13 percent will be built elsewhere on the Forest. The quality of the developed site experience will be high due to the attraction level and site conditions found in concentrated recreation areas.

In this alternative, developed recreation opportunities will be affected primarily by the substantial alpine ski area development in the Mammoth and upper Deadman Creek areas. The population of Mammoth Lakes will be expected to triple in support of a comparable increase in alpine skiing, and the private land base for community needs will also expand. Private development will most likely expand to the east and north into the Shady Rest area, eliminating the use of that concentrated recreation area. Most of the new recreation facilities in the Mammoth Lakes Basin and Reds Meadow area will serve day-use activities in response to an increased year-round resident population base. Overnight facilities will be reduced accordingly.

The developed site potential in the Deadman Creek area will be precluded by access routes and base facility developments associated with San Joaquin and White Wing ski areas.

<u>Dispersed Recreation:</u> The quality of dispersed recreation activities and opportunities will increase due to a full complement of well-maintained facilities which will disperse use, lessen concentrations of people, and reduce adverse impacts on sensitive riparian areas. Users will find moderate levels of control and enforcement to reduce conflicts between activities. OHV users will find more freedom of movement with new open areas in the Inyo Mountains, the base of the Sierra Escarpment south of Big Pine, and the Excelsior area. OHV use will be more regulated and controlled on lands adjacent to communities. Fishing opportunities will increase under this alternative, while hunting opportunities will decline.

The estimated demand for dispersed recreation will be met in the first through the third decades, but only 77 percent of demand will be met in the fifth decade with 2.4 million annual non-wilderness RVDs.

An 85 percent increase in dispersed RVDs in concentrated recreation areas will be facilitated by the addition of 180 miles of new trails and new concentrated recreation areas in the Owens River and Parker Lake-Sawmill

Canyon areas. It is possible, however, that most of the Shady Rest-Sherwin concentrated recreation area will have to be eliminated due to community growth.

Dispersed use in roaded portions of the Forest will increase 165 percent during the next fifty years. The San Joaquin and upper Deadman Creek-Dry Creek areas will become much more accessible due to intensive alpine ski area development. Timber harvest will stimulate the development of new roads into the San Joaquin and Monache areas. Dispersed recreation activities in Monache will shift toward the use of two-wheel drive vehicles with improved access. Use of the unroaded areas of the Forest will increase slightly with local community growth.

Nordic skiing use will be greatest under this alternative with a 300 percent increase by the fifth decade. Approximately 575 miles of trails and track will accommodate 500,000 RVDs of skiing use. Increased use will be supported by the greatly expanded ski resort community inherent in this alternative. Most expansion will take place in the Deadman and Dry Creek areas north of Mammoth.

OHV open areas will increase by 45,800 acres. Although portions of the Jeffrey pine forest now open will be restricted, new acreage in the Inyo Mountains, Sierra foothills, and northern Inyo Mountains will be open to use. Closed OHV areas will increase by 339,000 acres due to recommended wilderness areas. OHV use on the rest of the Forest will be restricted to roads and trails. Thirty-seven miles of OHV-only routes in the Monache area will be eliminated due to improved access required for timber harvest. Open areas for snowmobile use will decrease due to new wilderness and ski developments.

Recreation Opportunity Spectrum: Demand will be met or exceeded in SPM, RN, and RM ROS classes throughout the 50-year period. Opportunities in the Rural class will come closest to meeting demand under this alternative. Opportunities in the Primitive and SPNM classes will not meet demand. However, with the addition of trails of all types in SPM and RN classes, use could be shifted from SPNM to those classes. Opportunities in the Primitive class, as in all other alternatives, will be limited by capacity controls in wilderness.

Users will find both the RM and Rural ROS classes intensively developed. User contact will be high, and opportunities for solitude will be low. Extensive trail systems will facilitate the dispersal of people and activities. Activities in these classes will be highly regulated with visible controls, particularly as related to motorized activities.

Forest-wide acreage will shift mainly toward the Rural end of the spectrum. However, the SPNM class will also increase with wilderness recommendations for the Coyote Plateau area and most of the northern White Mountains. Even though there will be more acreage in established OHV open areas, the SPM ROS class will be reduced due to wilderness recommendations and alpine ski area development. Substantial shifts of Roaded Natural towards RM and R will also occur. The total acres shifting between classes will represent only 5.4 percent of the Forest.

AMN: (Maximize All Amenities)

Developed Recreation: This alternative will provide a wide range of high quality developed recreation activities and opportunities, but in limited quantities. The user will enjoy uncrowded conditions and well-maintained and totally rehabilitated facilities, including a full package of day-use and interpretive facilities. Although controls and enforcement will rarely be visible, conflicts between users will be low. Chances to find solitude, even for developed site users, will be the greatest under this alternative. However, many people will not be able to find a recreation site during the peak season and will have to vacation elsewhere or schedule their visit for a different time of year.

In this alternative, developed recreation will increase very slightly over current output levels over five decades. By the fifth decade, 60 percent of inventoried potential sites will have been developed and 53 percent of estimated demand will be met with approximately 1.9 million annual developed site RVDs.

The opportunities provided will be similiar in quantity to the existing situation, but a better balance will be achieved between overnight and day use due to increases in interpretive site development and other day-use facilities. The attraction level and site conditions of existing facilities will be improved under standard levels of operation for a higher quality recreational experience.

Developed recreation management will be limited by the emphasis on riparian, visual, and wildlife objectives. No new concentrated recreation areas will be developed under this alternative, in order to avoid impacts on wildlife and riparian values. These values include key deer winter range, key deer holding areas, the unroaded character of the San Joaquin area, and small riparian areas that currently receive little recreation use.

Dispersed Recreation : Because this alternative has a low level of developed site capacity, it will also have a low levels of dispersed use. However, with full development of dispersed trails, parking, and information facilities, the quality of the experience will be the greatest of any alternative on all areas of the Forest. Primitive forms of recreation will be at their highest levels, due to the vast acreage of additional wilderness and limited access management. Capacity controls on wilderness and the topography of recommended areas will not, however, provide for substantial increases in use. Solitude, challenge, and isolated camping situations will be emphasized. Users will find only limited evidence of on-the-ground controls. Fishing and hunting opportunities will be at their highest due to improved habitat conditions for fish and deer. OHV use will be the most severely restricted under this alternative, and controls and enforcement will be readily apparent. OHV enthusiasts will not come to this area, but will go elsewhere, particularly for major events.

The estimated demand for dispersed recreation will be met through the first decade and most of the second decade. By the fifth decade, however, only 54 percent of demand will be met with 1.7 million annual dispersed non-wilderness RVDs.

As the slight reduction of developed sites in concentrated recreation areas will be offset by increases in local community use, dispersed recreation in those areas will remain at current levels over the planning horizon. At least 80 miles of new trails will be constructed to better disperse use and protect resources.

Some development in roaded portions of the Forest, as well as improved highway access to the Eastern Sierra, will generate a 77 percent increase in dispersed use on roaded lands. Dispersed recreation use in unroaded areas will increase slightly.

Nordic skiing will increase 220 percent by the fifth decade. Approximately 425 miles of additional trails and track, most of that privately developed, will accommodate 405,000 annual RVDs.

Off-highway vehicle use will be de-emphasized in this alternative. Most existing and potential open areas will be recommended for wilderness or will be managed under limited access guidelines with an emphasis on wildlife, visual, riparian, or primitive recreation opportunities. This alternative will have the largest acreage closed to summer OHV use, and most of the rest of the Forest will be restricted; only 14,500 acres will be open. Winter open-OHV areas also will be reduced because of wilderness recommendations, conflicts with nordic skiers, and potential impacts on wildlife. OHV use of the Monache area will be retained to the degree compatible with deer habitat management in that area.

All forms of dispersed recreation will be managed at standard levels of operation.

Recreation Opportunity Spectrum: Demand will be met or exceeded in the SPNM, SPM, and RN ROS classes. As the Primitive class will be limited by capacity controls, projected demand could not be satisfied. Even the 510,800 acres of new wilderness will contribute little in the way of recreation opportunity, as these acres have limited capacity for use. The slight decline in Rural and increase in RM reflect the low level of new development key to this alternative.

The major shift of acres is from RN and SPM to SPNM due to wilderness recommendations. This shift represents the greatest change of acres under any alternative, but still involves only 10.3 percent of the Forest.

AMB: (Emphasize Wildlife and Recreation)

Developed Recreation: This alternative provides a wide range of activities and opportunities. The user will find well-maintained sites, available space during most seasons, and little resource damage due to overuse. Densities in concentrated recreation areas will have increased over base year.

The estimated demand for developed recreation will be met into the third decade. By the fifth decade, although 80 percent of inventoried sites will be developed, only 74 percent of estimated demand will be met with 2.7 million annual developed site RVDs.

The opportunities available will represent a quality balance of overnight and day-use facilities and activities provided by both the public and private sectors. RV parks and nordic ski resorts will increase. All sites will be brought to standard levels of service in the first two decades. Of the newly constructed facilities, 75 percent will be located in existing concentrated recreation areas and the other 25 percent will be in other roaded portions of the Forest. No new concentrated recreation areas will be created. The upper Deadman Creek potential concentrated recreation area will be reserved for future use, but will not be developed in the first 50 years. Full recreation development in concentrated recreation areas will not occur because of potential impacts on riparian area-dependent wildlife.

Dispersed Recreation: Moderate levels of dispersed recreation will be available in concentrated recreation areas and roaded portions of the Forest. The concentrated recreation areas could have periods of high-density use, with increased rates of contact between users. Well-defined trail, parking, and information systems will help to pull use away from developed sites and to increase convenience for the users.

Semi-primitive and primitive forms of recreation opportunities will be at high levels of use due to the large amount of acreage under the wilderness and limited access prescriptions. Even though most of the acres on the Forest will be available for primitive forms of recreation, however, the total amount of use in those categories will not increase greatly due to capacity controls on wilderness and limited physical capacity elsewhere.

Opportunities for solitude, challenge, and isolated camping situations will be emphasized, with little evidence of on-the-ground controls. OHV users will be severely restricted during the summer, with major reductions in open areas. Restrictions and enforcement will be highly visible. Organized motor vehicle events will be discouraged. Fishing and hunting opportunities will be enhanced by the emphasis on game species habitat management.

The estimated demand for dispersed recreation will be met in the first decade through the third decade, but only 70 percent of demand will be met in the fifth decade with 2.3 million annual non-wilderness dispersed RVDs.

By the fifth decade there will be a 51 percent increase in dispersed RVDs in concentrated recreation areas. Approximately 120 miles of trail will be built to help accommodate increased use and to broaden the range of activities and opportunities.

Dispersed recreation use in other roaded portions of the National Forest will increase 131 percent by the fifth decade. Dispersed recreation use in unroaded areas will increase slightly due to local community growth.

Nordic skiing will expand, resulting in a 180 percent increase by the fifth decade. Approximately 475 miles of trail and track will accommodate 360,000 RVDs of dispersed skiing, mostly in the Dry Creek-Deadman area.

OHV use will continue in all existing open areas except the southern White Mountains. As no new areas will be added, open acreage will be reduced 50,100 acres Forest-wide. The Monache area will still be oriented towards dispersed OHV recreation. Closed areas will increase by 222,700 acres

because of wilderness recommendations. Snowmobile use will be restricted due to wilderness recommendations, nordic and alpine ski areas, and potential impacts on wildlife.

All dispersed recreation will be managed to standard levels of operation.

Recreation Opportunity Spectrum: All ROS classes except Primitive and Rural will meet or exceed demand in the fifth decade. Primitive opportunities will be capped by quotas in wilderness, as in all other alternatives. Rural ROS class needs could be partly absorbed in the RM class where there is some excess of supply over demand. This will not be true for the alpine skier, however.

Primitive acres remain essentially the same. Other classes will have substantial increases generated by reductions in the Roaded Natural ROS class. The total shift in acres represents 8.3 percent of total Forest acres.

RESEARCH NATURAL AREAS

Introduction

There are no Forest activities that have direct effects on the seven Research Natural Areas (RNAs) on the Forest. Those RNAs are: Harvey Monroe Hall, Indiana Summit, Sentinel Meadow, McAfee Meadow, White Mountain, Whippoorwill Flat, and Last Chance Meadow.

Different alternatives could, however, have different indirect effects on RNAs. Since RNAs are managed with the objective of maintaining natural ecological processes, any activity that altered those processes will represent an impact.

Indirect effects will typically be generated by the Forest activities occurring on lands immediately surrounding an RNA. If activities on surrounding lands had the potential to affect natural ecological processes, and if there were a reasonable chance of those activities illegally or inadvertently occurring within the RNA, the risk of indirect effects will be present.

Indicators

The indirect effects of alternatives on RNAs are examined in terms of the following indicators of land uses immediately surrounding RNAs:

1. Domestic livestock grazing
2. Wilderness designation
3. Public fuelwood gathering
4. Mineral activities.

Grazing animals could trample native vegetation; and due to the tendency of grazing animals to favor palatable species over unpalatable ones, natural vegetative species distribution and abundance could be altered.

Wood gathering removes dead, down logs, which are an important component of natural forest ecosystems.

Dispersed recreation could involve the trampling of vegetation, soil disturbance, and/or an increased risk of human-caused fires. The primary potential source of increased dispersed recreation will be wilderness designation superimposed on RNA designation. As most RNAs are located in Further Planning Areas, wilderness designation is an option considered in the planning process.

Mineral activities include the use of Motorized equipment, ground disturbance, and increased human use of an area, including the increased risk of fire.

Assumptions

Forest-wide Standards and Guidelines and the RNA Prescription will apply to these areas under each alternative. It is assumed that these sources of direction will minimize the possibility that any alternative will have a noticeable direct effect on any individual RNA or on RNAs considered as a group.

Grazing, camping, wood gathering, and mineral activities are prohibited in RNAs; daytime dispersed use is discouraged. Although there is no reasonable means of enforcing those prohibitions perfectly, it is assumed that the RNAs on the Forest are unlikely to attract such uses. Where RNAs are contained within grazing allotments, they lie on the edge of the allotment or on steep, high-elevation lands with poor forage. The few RNAs with fuelwood sources are mostly inaccessible by vehicle. All but the Hall RNA are located away from recreational destination points and travel routes. Mineral-potential ratings for most RNAs and surrounding lands are low.

Consequences Common to All Alternatives

In the Forest planning process, candidate RNAs have been treated as if they were already established. The number of RNAs does not, therefore, vary by alternative. For this reason, and because of the assumptions discussed above, environmental consequences will not be expected to vary by alternative for RNAs. The following figure illustrates the low level variation between alternatives in terms of overall effects on RNAs, when considered collectively.

Table 85
Indicators of Effects on Research Natural Areas

Research Natural Area	Potentially conflicting uses of surrounding lands*						
	1982	PRF	CUR	RPA	CEE	AMN	AMB
Harvey Monroe Hall	M	M	M	M	W	W	M
Indiana Summit	F	F	F	F	F	F	F
Last Chance Meadow	W	W	W	W	W	W	W
McAfee Meadow	G	G	G	G	G,W	G,W	G
Sentinel Meadow	F	F	F	F	F	F	F
Whippoorwill Flat	F,M	F,M	F,M	F,M	F,M	F,W	F,W
White Mountain	-	-	-	-	W	W	-
Net change from base year	-	-	-	-	+3W -1M	+4W -2M	+1W -1M

* G=grazing; W=wilderness; F=fuelwood gathering; M=mineral activities.

RIPARIAN AREAS

Introduction

Forest activities that have major potential effects on riparian areas include livestock grazing, energy development, recreation, stream rewatering, and watershed management.

Consequences of these activities are assessed in terms of surface water availability, amount of riparian acreage lost or gained, and overall condition of riparian vegetation.

Indicators

1. Livestock grazing
2. Energy development (hydroelectric and geothermal)
3. Developed summer recreation use
4. Alpine ski area development
5. Stream miles rewatered
6. Watershed improvement (wet meadow restoration).

Livestock spend a disproportionate amount of time in riparian areas. The amount of grazing affects the quality of riparian areas, primarily due to the

trampling of vegetation, soil disturbance, and stream sedimentation. The primary impacts of grazing on riparian areas will be associated with the 1,000 to 2,000 acres of scattered wet meadows found in areas on which grazing increases under some alternatives. Areas with the greatest potential for increased grazing are along the base of the Sierra Escarpment and in the Glass Mountain area, most of which have little in acreage in stream or lake-related riparian vegetation. The effects of livestock on riparian areas can be mitigated by reducing the amount of time animals spend in those areas. This can be accomplished by fencing, salting, herding, water development, or deferring grazing. Range management guidelines for riparian area protection will be incorporated in allotment management plans as they are updated. It is unlikely that potential livestock impacts can be completely mitigated, however, so potential inadvertent impacts are represented by the overall level of grazing on the Forest.

Given the soils on the Inyo, when headcutting and streambank cutting occurs as a result of grazing or other impacts, the water table drops and the characteristics of the meadow change to more dry-site communities. When this occurs, removal of livestock will not suffice in the restoration of meadows. Watershed restoration work can raise the water level and shift the meadow back to more wet-site plant communities. Methods that can be used include fencing, revegetation, gabion check-dams and modified grazing practices or reduced use.

Hydroelectric projects remove some or all of the water from affected reaches of stream, reducing the amount available to support riparian vegetation. Geothermal development requires water for cooling and recharge, reducing water availability for riparian area-dependent resources. Although the use of either surface water or groundwater sources could affect riparian areas, the depletion of surface water will have the most immediate and direct effects. In addition to water depletion, spills from broken pipes could pollute nearby water sources, potentially affecting riparian values.

Summer recreation use is typically greatest in concentrated recreation areas associated with lakes and streams. Heavy recreation use tends to result in trampled riparian vegetation, eroded streambanks, increased stream channel sedimentation, and disturbance of riparian area-dependent wildlife. The overall amount of recreation use is difficult to control. The potential impacts of that use can be mitigated by developing facilities, such as trails and signs, that improve the resistance of riparian areas to heavy use or that direct and educate the user. As dispersed use of riparian areas is proportional to developed site use in concentrated recreation areas, developed site use is an indicator of total use.

Alpine ski areas consume water for domestic uses and irrigation. The amount of water consumed, and the consequent reduction in water available to support riparian vegetation, is proportional to ski area capacity.

Where dewatered streams are rewatered, riparian habitat can be reestablished. The opportunity to rewater streams arises when new licenses are issued for existing hydroelectric projects.

Of the 26,000 acres of wet meadows on the Forest, 23,500 acres have been damaged or are threatened with damage triggered by the mismanaged grazing of

30 to 100 years ago. Although grazing has been dramatically reduced, and range management practices have improved, the accelerated erosion resulting from past abuses continues to be a problem needing attention. Watershed improvement work in wet meadows arrests the process of accelerated erosion and enables eroded areas to heal. Wet meadows that are not treated are susceptible to continued erosion, resulting in the eventual lowering of the water table and replacement of riparian vegetation with dryland species.

Assumptions

Rewatering of streams and watershed improvement work have the greatest potential to maintain, enhance, and/or increase riparian vegetation on the Forest.

The relationship between impacts on riparian areas and impacts on fish habitat (discussed separately) are closely related. However, in some cases the impact can seriously affect riparian areas without affecting fish, as the riparian areas affected do not support fish habitat. On the other hand, fish habitat improvement within the stream channel itself does not have noteworthy effects on the riparian area.

The relationship between impacts on riparian areas and impacts on soil and water are closely related. However, some activities that affect soil stability do so away from water, minimizing the effects on riparian habitat.

The potential impacts of timber management on riparian habitat are minor since few riparian areas are located within suitable timber, and those within suitable timber are protected by Forest-wide Standards and Guidelines.

Implementation of the Forest-wide Standards and Guidelines will minimize the long-term impacts of new activities on riparian areas under all alternatives.

Impacts from energy development can be mitigated by moderating the size and location of development.

The cumulative effects of geothermal fluid removal on surface groundwater supplies are poorly understood and difficult to predict at this time.

Consequences Common to All Alternatives

The likelihood of energy development is assumed to be the same under all alternatives. There are 33 applications for new hydroelectric projects on approximately 60 miles of stream. Six power plants in Lease Blocks I and II represent geothermal development under all alternatives.

Fifteen miles of stream will be rewatered under all alternatives; 345 acres of riparian vegetation will result from rewatering.

Consequences that Vary by Alternative

Table 86 displays the effects of alternatives on riparian areas.

Table 86
Indicators of Effects on Riparian Areas
(end of the fifth decade)

Indicator	Base Year 1982	Alternatives					
		PRF	CUR	RPA	CEE	AMN	AMB
Livestock grazing (M AUMs)	41.4	41.4	39.1	55.6	46.5	35.1	39.4
Developed summer recreation use (M RVDs)	1.8	2.9	1.9	2.9	2.9	1.9	2.7
Wet meadows subject to accelerated erosion (M acres)	23.5	0	21.5	13.6	0	0	0
Watershed improvement work (M acres)	0.04	23.5	2.0	9.9	23.5	23.5	23.5
Streams rewatered (miles)	0	15	15	15	15	15	15

PRF: (Preferred) The potential impacts of livestock grazing will decrease on riparian areas. No increase in livestock numbers are planned. Riparian areas will be managed in a manner that will improve the condition of these areas. Various livestock management methods will be utilized to protect or enhance the quality of riparian areas. If suitable management strategies cannot be utilized or fail to improve riparian habitat conditions, reduction or elimination of livestock use on these areas will be viable options.

Watershed improvement within meadow communities will be an integral part of riparian habitat improvement. Approximately 23,500 acres of meadow will be subject to watershed improvement. The net effect of this alternative will be an improvement in riparian area condition and grazing practices associated with these areas.

CUR: (Current Program) The potential impacts of livestock grazing on riparian vegetation will change little in the first two decades. Damage will increase moderately in later decades as brush became decadent and animal numbers exceeded the overall carrying capacity of the dry range, forcing livestock into riparian areas. The impacts of recreation use in concentrated recreation areas will change little, as there will be very little increase in use by the fifth decade. The lack of new site protection facilities will, however, allow for existing impacts to continue, and riparian condition in concentrated use areas to worsen over time. The consumptive use of water by ski areas will nearly double with increased capacity.

These adverse effects will not be offset by the minimal amount of watershed improvment in wet meadows; 21,500 acres of untreated wet meadow will continue

to be damaged by accelerated erosion. The net effect of this alternative will be a substantial reduction in the quality and quantity of riparian vegetation because budget limitations will limit the investment needed to correct past problems and mitigate potential recreation impacts.

RPA: (1980 RPA Program) The potential impacts of livestock grazing on riparian vegetation will increase substantially, primarily in those areas on which the 34 percent increase in grazing will occur. Livestock forage utilization will average 60 percent in most areas, in contrast to 50 percent at present. Increased utilization of riparian vegetation could affect riparian condition. The impacts of recreation use in concentrated recreation areas will be high, with a 57 percent increase in use by the fifth decade; These impacts will be offset somewhat by the construction of new trails, signs, and other site-protection facilities. The consumptive use of water by ski areas would more than double with increased capacity.

These adverse effects will be offset slightly by watershed improvement in wet meadows; however, 13,600 acres will still be subject to accelerated erosion. The net effect of this alternative will be a moderate overall reduction in the quality and quantity of riparian vegetation, as the investment in repairing past damage will not be great enough to offset the potential inadvertent impacts of greatly increased commodity production and recreation use.

CEE: (Maximize Cost-Efficiency) The potential impacts of livestock grazing on riparian vegetation will increase moderately, primarily in those areas on which the 12 percent increase in grazing will occur. The potential impacts of recreation use in concentrated recreation areas will be high, with a 57 percent increase in use by the fifth decade; these impacts will be offset somewhat by the construction of new trails, signs, and other site-protection facilities. The consumptive use of water by ski areas will triple with increased capacity.

These adverse effects will be offset by full watershed improvement in wet meadows. The net effect of this alternative will be the overall maintenance of quality and quantity of riparian vegetation.

AMN: (Maximize All Amenities) The potential impacts of livestock grazing on riparian vegetation will decline with an overall 15 percent reduction in grazing outputs. The potential impacts of recreation use in concentrated recreation areas will be low, as total use will increase only slightly and any residual impacts will be offset by the construction of new trails, signs, and other site-protection facilities. The consumptive use of water by ski areas will increase 50 percent with increased capacity. Any potential adverse effects will be more than offset by full watershed improvement in wet meadows. The net effect of this alternative will be a substantial improvement in the overall quality and quantity of riparian vegetation.

AMB: (Emphasize Wildlife and Recreation) The potential impacts of livestock grazing on riparian vegetation will decline with the overall five percent

reduction in grazing outputs. The potential impacts of recreation use in concentrated recreation areas will be moderately high, with a 44 percent increase in use by the fifth decade; these impacts will be offset somewhat by the construction of new trails, signs, and other site-protection facilities. The consumptive use of water by ski areas will more than double with increased capacity.

These potential adverse effects will be more than offset by full watershed improvement in wet meadows. The net effect of this alternative will be a moderate improvement in the quality and quantity of riparian vegetation.

SENSITIVE PLANTS

Introduction

Forest activities that have major effects on sensitive plants include facility construction, energy and minerals development, fire management, range management, recreation management, timber management, wildlife management, and wilderness area recommendations.

Consequences of these activities are assessed in terms of relative potential threats to sensitive plant habitat. Data sources for this analysis include existing field inventories, literature, and sensitive plant species status reports.

Indicators

1. Trail construction (other than nordic ski trails)
2. Road construction (other than mining/geothermal)
3. Timber site preparation
4. Wildfire suppression
5. Vegetation treatment for range and wildlife
6. Geothermal and mineral development
7. Alpine ski area development
8. Developed recreation site capacity
9. Wildernesses recommendations.

The first eight indicators represent land-disturbing activities and associated potential threats. The greater the number of acres of land disturbed, the greater the likelihood of inadvertently damaging or destroying sensitive plant habitat. Wildfire suppression activities, including the mechanical construction of fire lines and base camps, will have the greatest potential for impacting unknown sensitive plant habitat. Planned projects requiring environmental analysis and sensitive plant clearance will have the least potential to impact unknown habitat.

Indicator nine represents a reduction in potential threat based on the restricted amount of use and type of activities allowed in wilderness. The greater the acreage recommended for wilderness, the lower the likelihood that sensitive plant habitat will receive adverse impacts.

Assumptions

Implementation of Forest-wide Standards and Guidelines and Management Prescription direction will minimize the likelihood of Forest activities jeopardizing the viability of sensitive plants or resulting in damage or destruction of their essential habitat.

Any proposed Forest-initiated or -authorized project with the potential for environmental impacts requires an environmental analysis with preparation of appropriate environmental documents. Sensitive plant habitat needs are always addressed in such analyses; inventories are conducted and mitigation prescribed where necessary.

Consequences that Vary by Alternative

Table 87 displays how the indicators of effects on sensitive plant habitat will vary by alternative. It also displays the relative potential threat to sensitive plant habitat. A high threat rating applies to those alternatives where the amount of projected land disturbance is high (top 1/3) relative to other alternatives and the amount of recommended wilderness is low (bottom 1/3) relative to other alternatives. Low relative disturbance and high-level recommended wilderness will produce a low threat rating.

Table 87
Indicators of Impacts on Sensitive Plant Habitat
(end of the fifth decade)

	Alternatives					
Indicator	PRF	CUR	RPA	CEE	AMN	AMB
New trail construction						
(non-nordic miles)	285	28	263	325	179	209
(M acres disturbed)	0.3	<0.1	0.3	0.3	<0.1	0.2
New road construction						
(miles)	87	46	103	65	14	38
(M acres disturbed)	0.2	0.6	0.3	0.2	0.4	0.1
Timber site preparation (M acres)	20.5	30.0	55.6	18.8	7.4	11.5
Wildfire (M acres burned)	53.2	52.9	53.2	64.5	48.2	48.2
Vegetation treatment for range and wildlife (M acres)	114.7	85.6	118.5	116.6	111.3	109.0
Geothermal and mineral development (M acres disturbed)	6.1	6.1	7.0	3.9	3.1	4.8
New recreation site capacity (M acres disturbed)	1.0	0	1.0	0.9	0	0.4
Total land disturbance (M acres)	196	175.3	235.9	205.2	172.0	182.3
Relative disturbance level	M	L	H	H	L	L
Recommended wilderness (M acres)	112.6	107.6	0	339.8	510.8	222.7
Relative protection level	L	L	L	H	H	M
Relative potential threat	MH	M	H	M	L	ML

H = high M = moderate L = low

PRF: (Preferred) The moderate relative level of projected land disturbance and low relative level of recommended wilderness will provide a moderately high-level threat of adverse impacts on sensitive plant habitat. Wildfire, which poses the greatest threat to sensitive plant habitat due to mechanical suppression and a lack of opportunity to analyze and mitigate effects, will represent 27 percent of total disturbance.

CUR: (Current Program) The low relative level of projected land disturbance and low level of recommended wilderness will provide a moderate-level threat of adverse impacts on sensitive plant habitat. Wildfire, which poses the greatest threat to sensitive plant habitat due to mechanical suppression and a lack of opportunity to analyze and mitigate effects, will represent 30 percent of total disturbance.

RPA: (1980 RPA Program) The high relative level of projected land disturbance and low level of recommended wilderness will provide a high-level threat of adverse impacts on sensitive plant habitat. Wildfire, which poses the greatest threat to sensitive plant habitat due to mechanical suppression and a lack of opportunity to analyze and mitigate effects, will represent 22 percent of total disturbance.

CEE: (Maximize Cost-Efficiency) The high relative level of projected land disturbance and high level of recommended wilderness will provide a moderate-level threat of adverse impacts on sensitive plant habitat. Wildfire, which poses the greatest threat to sensitive plant habitat due to mechanical suppression and a lack of opportunity to analyze and mitigate effects, will represent 29 percent of total disturbance.

AMN: (Maximize All Amenities) The low relative level of projected land disturbance and high level of recommended wilderness will provide a low-level threat of adverse impacts on sensitive plant habitat. Wildfire, which poses the greatest threat to sensitive plant habitat due to mechanical suppression and a lack of opportunity to analyze and mitigate effects, will represent 28 percent of total disturbance.

AMB: (Emphasize Wildlife and Recreation) The low relative level of projected land disturbance and moderate level of recommended wilderness will provide a moderately low-level threat of adverse impacts on sensitive plant habitat. Wildfire, which poses the greatest threat to sensitive plant habitat due to mechanical suppression and a lack of opportunity to analyze and mitigate effects, will represent 26 percent of total disturbance.

SPECIAL INTEREST AREAS

Introduction

There are no Forest activities that will have major effects on the one existing special interest area on the Forest, the Ancient Bristlecone Pine Forest Botanical Area.

Assumptions

Forest-wide Standards and Guidelines and Management Prescription direction applied to the Special Interest Area will be the same for each alternative. It is assumed that those sources of direction will protect natural integrity and natural features from threats to damage or destruction.

It is assumed that the amount of visitation to the Bristlecone Pine Forest will, under all alternatives, be influenced primarily by its national and international importance, rather than by variations in Forest management.

Consequences Common to All Alteratives

Alternatives do not differ in the number of Special Interest Areas or the acres included in these areas; the established area will be retained, and no new areas will be established. Candidate Geologic Special Interest Areas are protected under the Forest-wide Standards and Guidelines common to all alternatives, and provisions are made to evaluate them and make recommendations regarding their establishment.

Consequences on the Ancient Bristlecone Pine Forest are expected to be negligible under all alternatives. The area is withdrawn from mineral entry and is isolated geographically from timber harvest, intensive range management, and major increases in recreation use. The people who visit the area are those specifically attracted by the bristlecone pines, typically those who have a scientific interest in the trees and their ecology. Due to these factors, and due to limitations stipulated in the Management Prescription for the Botanical Area, there is little concern that Forest management will have adverse effects on the area under any alternative.

TIMBER

Introduction

The Forest activities most likely to affect timber management are recreation management, wildlife habitat management, visual quality management, and geothermal energy development.

Timber management activities on the Forest are guided by three principal factors: the need for economic growth and timber yield, the need to provide for vegetative diversity in the Forest environment, and the need to maintain forested lands in healthy condition on those lands where timber harvest is not a primary objective.

Consequences are measured in terms of total timber production, fuelwood available for public use, and the overall health and condition of forested ecosystems.

Indicators

1. Acres by regulation class
   - Size of openings
   - Rotation age

2. Regeneration harvest method

3. Timber outputs.

On the Inyo National Forest, a total of 110,700 acres of forested land is estimated to be capable, available, and tentatively suitable for growing crops of industrial quality wood. As each alternative for management of the Forest stresses different sets of resource values; tentatively suitable timber lands are managed under various resource emphases. The timber management strategies associated with different emphases are called regulation classes.

Regulation Class I is applied to lands on which timber growth and yield are minimally constrained by other resource values. Production is guided by by the principles of optimizing growth and yield.

Regulation Class II is applied to lands on which the total amount of regeneration harvest during any single decade is limited by a need for more physical dispersion of that harvest than allowed for in Regulation Class I. This strategy results in longer rotation ages, a broader range of timber age classes, and more vegetative diversity than Regulation Class I.

Regulation Class III is applied to lands on which both the number of acres and the size of regeneration harvest openings are limited by a primary emphasis on other resource values. This strategy applies to areas where timber harvest volume is of less importance than the maintenance of a healthy forest environment.

Unregulated lands are tentatively suitable timber lands excluded from annual programmed harvest because of an emphasis on other resource values. On those lands, only occasional timber harvest entries will be made for the purpose of salvaging dying trees and maintaining general stand vigor when economically feasible.

None of the alternatives project timber harvest or silvicultural activity on all of the land that is physically suitable and administratively available for timber management. The most suitable land is used by those alternatives that stress commercial products, and the least is used where other resource values or economics are limiting factors.

Most of the land managed for annual timber harvest is managed under Regulation Classes II and III. Regulation Class II represents the even-aged system of timber management under which regeneration harvest creates openings five to forty acres in size at some point in the growth cycle of each stand. Stands are generally no longer than twenty acres. Regulation Class III, on the other hand, represents timber management activities that will create openings no larger than two acres in size, and that will not noticeably affect the appearance of the lands managed. (Other uses of those lands, such as alpine skiing or other recreation development could, however, affect their appearance.) Regulation Class III represents uneven-aged management on the Inyo National Forest, with small-sized openings and minimal effect on natural appearance. However, this Regulation Class does not represent the classic

form of uneven-aged management under which a mixture of tree ages and sizes is maintained at all times within all stands.

Rotation age, when analyzed from a timber management point of view, is the age at which the mean annual growth of a stand reaches its maximum value as measured in cubic feet. However, rotation age also influences the amount of forested land being regenerated at one time, the range in tree sizes, and the maximum size attained by crop trees. The longer the rotation age, the fewer the acres regenerated at one time and the larger the final crop tree. Rotation ages are 140 years for Jeffrey Pine, 120 years for lodgepole pine, and 180 years for true firs. Tree size can be expected to reach 30 inches or more in diameter and 100 feet or more in height. The increase in the acreage managed under Class III can be used to accommodate resource values such as natural landscape appearance and wildlife dependent on older seral stages of forest.

All alternatives rely on the use of artificial regeneration (planting of seedlings) to regenerate stands harvested using even-aged techniques. Natural regeneration is not reliable on the Inyo National Forest because long periods elapse between the occurrence of adequate seed crops concurrent with the moisture adequate for survival of natural seedlings. Under the even-aged method of clearcutting, tree seedlings are planted after final harvest and site preparation. Under the shelterwood method, tree seedlings are planted following site preparation but prior to final harvest. Overstory removal means that adequate natural reproduction is already present in the stand, thus the stand will be fully stocked after removal of the overstory trees.

Most of the suitable Jeffrey pine stands on the Forest are understocked due to the past practices of partial cutting and relying on unreliable natural regeneration. Red fir has not been actively managed in the past, due to a lack of knowledge about regeneration in that type and the low level of demand for red fir on the wood products market. Consequently, suitable red fir on the Forest varies from the stands that are overstocked with young trees to those with highly decadent old growth. The management of lodgepole pine has become feasible due to an expanded market for fuelwood. Most suitable lodgepole pine stands on the Forest are poorly stocked and decadent.

The knowledge necessary to grow Jeffrey pine, red fir, and lodgepole pine currently exists and is in practice on the Forest. Economic conditions favoring the marketing of those species also exist. Consequently, timber lands on the Forest are expected to become more heavily stocked and more vigorous in growth due to active timber management.

Timber outputs are measured in terms of annual Allowable Sale Quantity, long-term sustained yield, timber stand improvement, and reforestation.

Consequences That Vary by Alternative

The following table displays the effects of alternatives on timber management.

Table 88
Timber Outputs by the End of the Fifth Decade

Outputs	1982	PRF	CUR	RPA	CEE	AMN	AMB
		Alternatives					
		(fifth decade)					
Allowable Sale Quantity MMBF	10.5	7.1	13.4	19.8	10.1	6.3	9.2
Fuelwood (M cords)	4.0	4.2	4.2	7.2	5.0	3.0	4.7
Long-term sustained yield MMBF	-	14.5	24.7	29.9	24.7	15.6	18.9
		(50-year average)					
Timber stand improvement (acres)		374	212	187	233	186	182
Reforestation (acres)		200	600	1113	376	147	231

PRF: (Preferred) This alternatives will utilize approximately 75,200 acres for timber production. The even-aged management system will be applied on 62,483 acres of these lands, which will be managed primarily for timber yields. The remaining 12,750 acres west of U.S. 395 will be managed under the uneven-aged management regime described in Regulation Class III to minimize conflicts with semi-primitive recreation, developed recreation, alpine ski area potential, and scenic quality. Approximately 35,500 acres of lands that would be suitable for timber production will not be managed because of overriding wildlife and recreation values.

An average of 7.1 MMBF of timber will be sold on an annual basis by the fifth decade, representing a 32 percent reduction from base-level outputs. The health and vigor of forested lands will improve on those acres managed for timber outputs and decline on unmanaged timber lands and lands inside wildernesses and Research Natural Areas.

CUR: (Current Program) This alternative will utilize approximately 89,100 acres for timber production. In the first decade, regeneration harvest will occur on 8,570 acres and intermediate harvest on 8,700 acres. This will shift to 8,420 acres of regeneration harvest and 29,100 acres of intermediate harvest by the fifth decade.

Under this alternative, the even-aged management system will be applied to about 85 percent of the land used for timber production. Of that total, 94 percent will be managed primarily for timber yields and 6 percent will be managed for timber yields to the degree compatible with Visual Quality Objectives. The remainder will be managed under the type of uneven-aged

management described in Regulation Class III to minimize conflicts with recreation development and scenic quality. Approximately 20 percent of tentatively suitable timber land will be unregulated due to a primary emphasis on recreation development, goshawk habitat, and geothermal development.

An average of 13.4 MMBF of timber will be sold on an annual basis by the fifth decade, representing a 28-percent increase relative to base-level outputs. The overall health and vigor of forested lands will improve on those acres managed for timber outputs and decline on unregulated lands and lands inside wildernesses and Research Natural Areas.

RPA: (1980 RPA Program) This alternative will utilize approximately 99,200 acres for timber production. In the first decade, regeneration harvest will occur on 8,280 acres and intermediate harvest on 8,100 acres. This will shift to 14,100 acres of regeneration harvest and 18,600 acres of intermediate harvest by the fifth decade.

Under this alternative, the even-aged management system will be applied to about 94 percent of the land used for timber production. Of that total, 98 percent will be managed primarily for timber yields, and 2 percent will be managed for timber yields to the degree compatible with Visual Quality Objectives. The remainder will be managed under the type of uneven-aged management described in Regulation Class III to minimize conflicts with recreation development. Approximately 10 percent of tentatively suitable timber land will be unregulated due to a primary emphasis on recreation opportunities, goshawk habitat, and geothermal development.

An average of 19.8 MMBF of timber will be sold on an annual basis by the fifth decade, representing an 89-percent increase relative to base-level outputs. The overall health and vigor of forested lands will improve on those acres managed for timber outputs and decline on unregulated lands and lands inside Wildernesses and Research Natural Areas.

CEE: (Maximize Cost-Efficiency) This alternative will utilize approximately 97,600 acres for timber production. In the first decade, regeneration harvest will occur on 8,850 acres and intermediate harvest on 5,000 acres. This will shift to 5,580 acres of regeneration harvest and 19,500 acres of intermediate harvest by the fifth decade.

Under this alternative, the even-aged management system will be applied to about 70 percent of the land used for timber production. Of that total, 97 percent will be managed primarily for timber yields and 3 percent will be managed for timber yields to the degree compatible with Visual Quality Objectives. The remainder will be managed under the type of uneven-aged management described in Regulation Class III to minimize conflicts with recreation development. Approximately 12 percent of tentatively suitable timber land will be unregulated due to a primary emphasis on recreation development (especially alpine skiing), goshawk habitat, and geothermal development.

An average of 10.1 MMBF of timber will be sold on an annual basis by the fifth decade, representing a 4 percent reduction relative to base-level outputs. The overall health and vigor of forested lands will improve on those acres managed for timber outputs and decline on unregulated lands and lands inside wildernesses and Research Natural Areas.

AMN: (Maximize All Amenities) This alternative will utilize approximately 61,800 acres for timber production. In the first decade, regeneration harvest will occur on 5,710 acres and intermediate harvest on 4,700 acres. This will shift to 3,320 acres of regeneration harvest and 17,600 acres of intermediate harvest by the fifth decade.

Under this alternative, the even-aged management system will be applied to about 83 percent of the land used for timber production. Of that total, 96 percent will be managed primarily for timber yields and 3 percent will be managed for timber yields to the degree compatible with Visual Quality Objectives. The remainder will be managed under the type of uneven-aged management described in Regulation Class III to minimize conflicts with recreation development and scenic quality. Approximately 44 percent of tentatively suitable timber land will be unregulated due to a primary emphasis on semi-primitive dispersed recreation, geothermal development, and habitat for wildlife species dependent on older seral stages of forest.

An average of 6.3 MMBF of timber will be sold on an annual basis by the fifth decade, representing a 41-percent reduction relative to base level outputs. The overall health and vigor of forested lands will improve on those acres managed for timber outputs and decline on unregulated lands and lands inside Wildernesses and Research Natural Areas.

AMB: (Emphasize Wildlife and Recreation) This alternative will utilize approximately 69,200 acres for timber production. In the first decade, regeneration harvest will occur on 6,540 acres and intermediate harvest on 6,200 acres. This will shift to 4,210 acres of regeneration harvest and 21,600 acres of intermediate harvest by the fifth decade.

Under this alternative, the even-aged management system will be applied to about 91 percent of the land used for timber production. All of those lands will be managed primarily for timber yields. The remainder will be managed under the type of uneven-aged management described in Regulation Class III to minimize conflicts with recreation development and scenic quality. Approximately 37 percent of tentatively suitable timber land will be unregulated due to a primary emphasis on semi-primitive dispersed recreation, geothermal development, and habitat for wildlife dependent on older seral stages of forest.

An average of 9.2 MMBF of timber will be sold on an annual basis by the fifth decade, representing a 13 percent reduction relative to base-level outputs. The overall health and vigor of forested lands will improve on those acres managed for timber outputs and decline on unregulated lands and lands inside wildernesses and Research Natural Areas.