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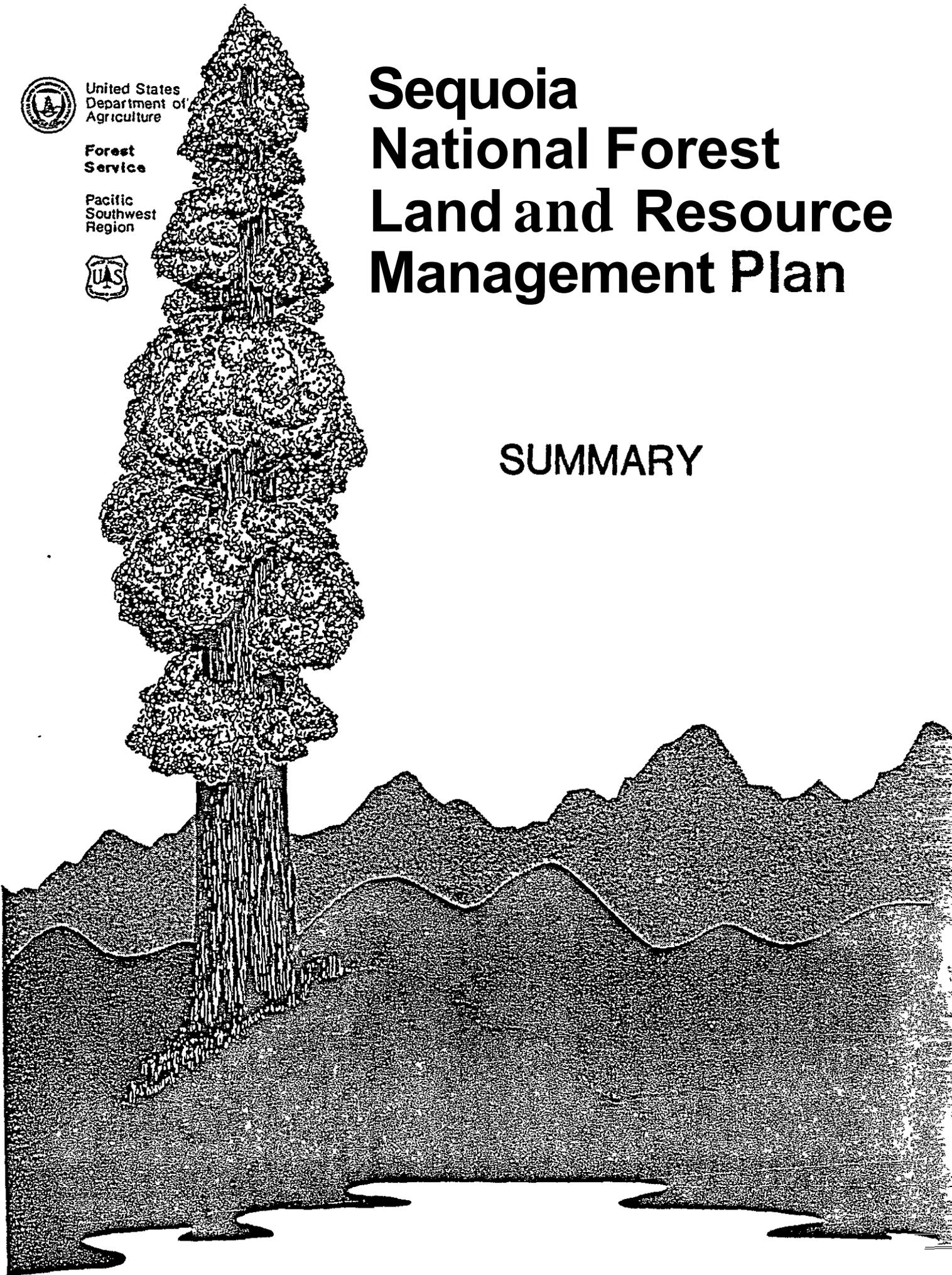
Forest
Service

Pacific
Southwest
Region



Sequoia National Forest Land and Resource Management Plan

SUMMARY



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FINAL ENVIRONMENTAL IMPACT STATEMENT

Sequoia National Forest
Land and Resource Management Plan

Type of Action: Administrative

Responsible Federal Agency: USDA, Forest Service

Responsible Official: Paul F. Barker, Regional Forester
Pacific Southwest Region
USDA, Forest Service
630 Sansome Street
San Francisco, California 94111

For Further Information Contact: James A. Crates, Forest Supervisor
Sequoia National Forest
900 West Grand Avenue
Porterville, California 93257
Telephone: (209) 784-1500

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A. PURPOSE AND NEED (FEIS, Chapter 1)

This Final Environmental Impact Statement (FEIS) describes the proposed action and alternatives for the management of the land and resources administered by the Sequoia National Forest. This proposed action is the basis of the National Forest Land and Resource Management Plan (Forest Plan), which is detailed in a separate document. For the purposes of disclosure under the National Environmental Policy Act (NEPA), the FEIS and Forest Plan are treated as combined documents.

Planning is conducted under the authority of the Multiple-Use and Sustained-yield Act of 1960 and the Forest and Rangeland Renewable

Resources Planning Act (RPA) of 1974, as amended by the National Forest Management Act (NFMA).

The area covered by this Plan includes lands within the National Forest System and Bureau of Land Management. The Forest boundary encompasses 1,173,200 acres, of which 1,119,045 are National Forest System lands.

The goal of the Forest Plan is to develop a fully integrated mix of management practices which provide for use and protection of Forest resources, satisfy guiding legislation, and address local, regional and national issues. The Plan directs the way the Forest will be managed for the production of goods and services in a way that maximizes long-term net public benefit in an environmentally sound manner.

Net public benefit is measured in three separate categories:

- 1) cash receipts such as from timber sales;
- 2) noncash benefits such as dispersed recreation; and
- 3) nonpriced benefits such as visual quality.

Present net value (PNV) is the portion of net public benefit comprised by the sum of cash receipts and noncash benefits minus the costs to produce them. Present Net Value on the Sequoia NF changes most in relation to the size of the timber and recreation programs, with noncash benefits constituting a substantial percent of the total PNV. Non-priced benefits are changed most in relation to the level of vegetative treatments, primarily timber harvest and prescribed burning (see Glossary and Appendix D).

Development of the Forest Plan began with public involvement efforts to determine public issues. Forest Service management concerns were also identified and combined with the public issues to form an integrated list of issues and concerns. These issues and concerns were used to guide the development of alternatives and their evaluation. The Forest issues, found in Chapter 1 of the FEIS, are primarily concerned with the major topics of:

- Wilderness Management and Further Planning Areas
- Land Ownership Adjustment
- Water Yield and Use
- Recreation
- Interpretive Services Opportunities
- Special Area Classifications
- Off-Highway Vehicle Management
- Timber Harvesting
- Giant Sequoia Management
- Fish and Wildlife Habitat
- Rangeland Management
- Roads and Trails Management and Maintenance
- Energy Production
- Streams and Wetland Management
- Plant and Animal Diversity.

As a result of public review of the Draft Environmental Impact Statement (DEIS) the following additional issues were identified:

- Pesticides
- Budget
- Visual Resources
- Wild and Scenic Rivers - Kings River, Segment 1

A proposed course of action and six alternatives to the proposal have been developed to address these planning issues. The alternatives are described in the next section.

B. ALTERNATIVES INCLUDING THE PROPOSED ACTION (FEIS, Chapter 2)

In response to planning questions, legislation, and regulations, a range of alternatives was initially developed and analyzed in the Draft Environmental Impact Statement (DEIS). Each alternative had a different management emphasis resulting in different levels of resource management. Forest-wide standards and guidelines served to assure quality land stewardship in all alternatives. The multiple-use nature of the alternatives provided a mix of outputs and insured that no single resource element was emphasized to the extent that another resource was excluded.

In response to public comment on the DEIS, several alternatives have been modified and three have been dropped. The Preferred Alternative responds to public input by considering a combination of even-aged and uneven-aged management, managing off-highway vehicle (OHV) use on designated roads and trails, and several other changes.

AMN and WFV Alternatives were also modified in timber management technique. The former is managed under uneven-aged principles exclusively; the latter is managed predominantly under uneven-aged principles. The Low Budget (LBU), Current, Economic Dispersed (CED), and Wilderness/Capital Investment Emphasis (WLI) Alternatives have been dropped from the set of alternatives considered in detail. Analysis of those alternatives is retained in Chapter 2 of the FEIS. Those options were dropped because, relatively speaking, they were no longer considered responsive to public issues. Finally, under each alternative, habitat for the management of spotted owls contains 66,000 acres which receive no scheduled timber harvest.

The Proposed Action, as described in the FEIS, is the basis for the Forest Plan which is published in a separate document. While the Proposed Action and its six alternatives are analyzed in the FEIS over a 50-year time period, the life of the Forest Plan is expected to range from 10 to 15 years. The additional analysis is included as a means of testing the long-term implications of each of the alternatives. It is not intended that the Proposed Action or any of these alternatives would be in effect for 50 years.

The alternatives considered in detail are described below.

PREFERRED ALTERNATIVE (PRF)

This alternative is the Proposed Action. It produces market and nonmarket close to 1980 RPA target levels. Timber harvest utilizing both even- and uneven-aged silvicultural prescriptions, livestock grazing, dispersed recreation, and ski area development are emphasized.

Annual timber harvest volume increases from 97 MMF in the first decade to 100.5 MMF in the fifth decade. About 30 percent of this volume will be harvested under uneven-aged principles of silvicultural management while the remainder will be harvested using even-aged management techniques. Harvest of preferred market species is emphasized. Livestock grazing remains relatively constant during first decade with fluctuations occurring in the annual grassland and chaparral ecosystems. Off-highway vehicles (OHV's) may be operated on designated roads and trails. Cross-country use of OHV's is prohibited. Besides Peppermint, two additional ski areas are to be studied for development over the long-term. About 12,500 acres of the BLM Rockhouse Wilderness Study Area are recommended for wilderness designation. The average annual budget for the first decade is \$20.0 million.

CURRENT ALTERNATIVE (CUR)

This alternative emphasizes production of timber and cattle over developed recreation and nonmarket resources. It is a continuation of present management direction.

Timber harvest volume remains constant at 94.4 MMF from the first to the fifth period. Livestock grazing remains constant during the planning period. Emphasis within recreation management is on maintenance of current recreational facilities at low standard levels. In addition to Peppermint, two additional ski areas are to be studied for development. Off-highway vehicles are restricted to roads and trails on some areas of the Forest. Other areas are open to cross-country travel. Further Planning Areas are not recommended for wilderness designation. The estimated yearly budget in the first decade is \$16.3 million.

1980 RESOURCE PLANNING ACT PROGRAM ALTERNATIVE (RPA)

This alternative meets or exceeds the Sequoia National Forest share of the Resource Planning Act goals.

Timber harvest volume remains constant at 101.3 MMF from the first decade to the fifth. About 30 percent of this volume is harvested under uneven-aged principles of silvicultural management while the remainder will be harvested using even-aged management techniques. Livestock grazing use increases from current levels to 100,000 AUM's by the fifth decade. Emphasis within recreation management is on developed recreation. In addition to Peppermint, one additional ski area is to be studied for development. Off-highway vehicles are limited to designated roads and trails. About 12.650 acres of the BLM Rockhouse Wilderness Study Area are

recommended for wilderness designation. The average annual budget is approximately \$19.7 million.

AMENITY EMPHASIS ALTERNATIVE (AMN)

This alternative emphasizes high production levels of nonmarket resources, specifically wildlife and fish, dispersed recreation, visual quality and wilderness. Market resources including timber, range, and developed recreation are produced at economically efficient levels to support nonmarket resources.

Nonmarket resources are emphasized. Dispersed recreation areas are managed to encourage their use. Off-highway vehicle use is limited to designated roads and trails in order to reduce conflicts with other users. Winter snow use and equestrian uses are encouraged. The trail system is extended. In addition to Peppermint, one additional ski area is to be studied for development. All Further Planning Areas evaluated in this FEIS (127,000 acres) are recommended for wilderness designation. Nonconsumptive use of wildlife and fish receives priority over consumptive uses. Habitat improvement is concentrated outside conifer zones. About 43 MMBF of timber is harvested during the first decade, increasing to 54 MMBF by the fifth decade. Livestock grazing is reduced to about 55,000 AUM's in the first decade. The average annual budget for the first decade is \$14.7 million.

MARKET EMPHASIS ALTERNATIVE (MKT)

This alternative emphasizes high production levels of market resources, specifically timber, range, developed recreation. Nonmarket benefits are produced at economically efficient levels.

Timber, range and developed recreation are the priority resources. Harvest volume remains constant at about 126.5 MMBF per year from the first decade to the fifth. Livestock grazing increases to 75,000 AUM's. Emphasis is placed on developed recreation with management of dispersed recreation areas managed at low standard. Campgrounds are expanded and constructed. In addition to Peppermint, two additional ski areas are to be studied for development. The entire non-wilderness portion of the Forest is open for off-highway vehicle use. About 9,710 acres of BLM Rockhouse Wilderness Study Area are recommended for wilderness designation. Estimated yearly budget for the first decade is approximately \$24.3 million.

HIGH PRODUCTION EMPHASIS ALTERNATIVE (PRO)

This alternative meets the 1985 Regional high timber goals. It also produces other market resources at relatively high levels. Nonmarket benefits are produced at economically efficient levels.

Timber is the first priority market resource. Harvest volume remains constant at 133 MMBF per year from the first decade to the fifth. Livestock grazing increases to 76,000 AUM's. Emphasis is placed on developed recreation with management of dispersed recreation areas conducted at low standard. In addition to Peppermint, two additional ski areas are to be studied for development. Rivers are not recommended for designation under the Wild and Scenic River System. Areas are not

recommended for wilderness designation. Estimated yearly budget for the first decade is approximately \$24.6 million.

WILDLIFE, FISH AND VISUAL EMPHASIS ALTERNATIVE (WFV)

This alternative emphasizes high levels of recreational use associated with wildlife and fish, and visual quality. Management of other resources supports wildlife and fish goals and produces commodities at economically efficient levels.

The Piute and Scodies Mountains are managed for maximum wildlife recreational opportunities. Off-highway vehicle use is limited to reduce conflicts with wildlife. Equestrian use is encouraged. Trails and campgrounds are developed to meet hunting and fishing needs. Other than Peppermint, no additional ski areas are to be studied for development. Additional areas are not recommended for wilderness designation. Wildlife and fish habitat improvement is emphasized. Approximately 82 MMF of timber is harvested per year from the first decade through the fifth. Harvest unit size and location is limited by visual concerns. Livestock grazing is slightly reduced to 60,000 AUM's. The average annual budget during the first decade is approximately \$18.6 million.

C. AFFECTED ENVIRONMENT (FEIS CHAPTER 3)

1. GENERAL DESCRIPTION OF THE FOREST

The Sequoia NF is located at the southern end of the Sierra Nevada range within portions of Fresno, Tulare and Kern Counties. Elevations range from just under 1,000 feet on the western edge of the Forest on the Kings and Kern Rivers, to 12,432 feet on Florence Peak in the Golden Trout Wilderness.

Four major rivers drain the Planning Area. The Kings, Kaweah, and Tule Rivers flow almost due west through deep canyons in the western portion of the area. The Kern River drains the central and eastern portions of the Planning Area and is impounded at Lake Isabella.

The Kern River and its forks separates the southeastern portion of the Planning Area into distinct regions. Below Lake Isabella, the Kern River separates the Breckenridge Mountains from the Greenhorn Mountains. They are characterized by oak savanna at the low elevations, a chaparral zone, and a small area of conifer forest at the high elevations.

Upstream from Lake Isabella, the South Fork of the Kern River divides the Piute Mountains and Scodie Mountains from the Kern Plateau. The Piutes are similar to the Breckenridge Mountains but have a larger conifer forest zone. The eastern portion of the Piutes exhibits the desert influence, supporting Joshua trees and pinyon pine. The Scodie Mountains are a distinct desert mountain range with an extensive pinyon pine woodland.

The North Fork of the Kern River divides the Greenhorn Mountains from the Kern Plateau. The Greenhorns rise from the floor of the San Joaquin Valley with annual grassland and **oak** savanna at low elevations, a chaparral belt

at mid-elevations and a broad belt of conifer forests at higher elevations. The eastern side of the Greenhorn Mountains drops steeply into the Kern River Canyon.

The Kern Plateau region is across the upper Kern River from the Greenhorn range. This mountainous "plateau" is generally covered by mixed conifer forests with red fir at higher elevations. Subalpine trees and shrubs grow on the highest mountain tops.

The Tule River drains the northwest section of the Forest and is impounded on the valley floor at Lake Success. This area has annual grassland and oak savanna at low elevations, a steep chaparral belt at mid-elevations. The higher elevations are covered with mixed conifer forests with red fir and subalpine vegetation on the highest regions.

The northern unit of the Forest, the Hume Lake Ranger District, is isolated by administrative rather than geomorphic boundaries. This unit is bounded by the Sierra National Forest on the north and Sequoia and Kings Canyon National Parks on the south and east. The majority of the Hume Lake District is in the Kings River drainage. A portion of the southern part of the District is in the Kaweah River watershed. The vegetation of the Hume Lake District is similar to that of the rest of the Forest with annual grasslands and oak savanna at the lower elevations, chaparral at mid elevations and conifers at the higher elevations.

2. SOCIOECONOMIC ENVIRONMENT

The Sequoia NF's immediate sphere of influence includes Tulare and Kern Counties. Although a small portion of the Forest is within Fresno County, the Forest exerts negligible influence on that population.

Tulare County has a population of over 250,000. The median age is 28, yet those 65 or older account for 22 percent of the populace. The communities are generally rural in nature with agriculture dominating the County's economy. About one percent of the total employment comes from the timber industry.

Kern County has a population of over 400,000. The median age is 28.3 with 11 percent 65 or older. Somewhat more urbanized than Tulare County, the economy is centered on agriculture, oil, gas, and military bases.

Foothill communities in both Tulare and Kern counties located along access routes into the Forest are particularly affected by Forest management activities. Economics of these communities revolve around ranching, recreation and retirement annuities while the social groups consist of ranchers, retirees, young working families and second-home owners.

3. AIR QUALITY

Air quality has been deteriorating in the Planning Area from pollutants produced locally; but, primarily, from those generated in the San Francisco Bay area and transported to the Area by the prevailing winds. The Clean Air Act and State Pollution Control Standards have slowed this deterioration with the former assigning the Sequoia NF responsibilities to

protect the **air** quality related values of the Dome Land Wilderness. In addition, current management direction is to protect the area by prohibiting activities that would degrade the quality of the air.

4. CULTURAL RESOURCES

The Forest occupies transition zones between desert cultures to the east and Central Valley cultures to the west. Yokuts, Kawaiisu, Tubatulabal, and Mono Indian groups all utilized portions of the Forest. In historic times, large scale giant sequoia logging, gold mining, ranching and farming brought new settlers into this area.

To date, approximately 20 percent of the Forest has been inventoried to evaluate properties in project areas. About 1,100 prehistoric and historic properties have been recorded. Of these, approximately 235 have been evaluated for significance, and roughly two-thirds of these were judged eligible for nomination to the National Register of Historic Places.

5. DIVERSITY

On the Sequoia NF, several broad ecosystems can be described. These are the conifer forests, conifer woodlands, oak woodlands, and chaparrals. Within these ecosystems, there are inclusions of riparian zones, meadows and localized special components such as caves and talus slopes which provide important habitat for many species of fish and wildlife.

Management activities have altered the abundance, proportions, and distributions of seral stages existing in a given area. Most of the mixed chaparral vegetation has developed into older stages of mature to ~~overmature~~ dense brush fields. The oak woodland ecosystem has decreased in extent due to encroachment of conifers. The conifer forests have many stands with brush understories and regeneration areas of five to 40 acres.

6. EARTH RESOURCES

- a. Soil Resource: Most of the soils on the Forest are developed from weathered granitic rock and range from deep to shallow. They have a thin surface layer, slightly developed subsoil horizons, and textures of coarse sandy loam with low moisture and nutrient holding capacities.
- b. Surface Water Resource: The majority of the Forest is in the headwaters of the Tulare Lake Basin which lies at the southern end of the San Joaquin Valley. The main rivers draining the Forest are the Kings, Tule and Kern. These rivers are impounded in reservoirs. The water is used for agriculture in the San Joaquin Valley. The Forest's average annual water yield is estimated to be 736,000 acre-feet.

The Forest Service presently uses less than one-tenth of one percent of the runoff for timber harvest (dust abatement), grazing (watering troughs), recreation and administrative sites (domestic uses). Past water quality monitoring has shown that the water on

the Forest has been of good quality except for short-term high bacteria and sediment concentrations.

- c. **Groundwater Resources:** Drinkable groundwater has been found within 305 feet of the earth's surface on the Forest and typically at the surface in the form of springs. Twenty-four wells and thirty-five springs provide water for campgrounds and administrative use sites.
- d. **Geologic Hazards:** In the past, seismic and volcanic activity have been minor. Only small earthquakes have occurred on the Forest since 1900. Landslide hazards also have not been very important.

7. ENERGY

- a. **Energy Production:** Hydroelectric generation is the primary form of energy production in the Forest. There are six hydroelectric plants currently in operation with a combined output of 87.6 Megawatts. Firewood for home heating use accounts for approximately 20,000 cords harvested annually.
- b. **Energy Conservation:** Energy conservation efforts have been directed towards the reduction of fuel usage by the Forest Service fleet and improving the efficiency of Forest Service buildings.

8. FACILITIES

- a. **Forest Transportation System:** The Sequoia National Forest transportation system consists of 29 bridges, 1,471 miles of Forest development roads, 1,033 miles of abandoned roads, and 383 miles of road under the jurisdiction of others. Approximately 44 percent of the Forest is unroaded.
- b. **Buildings, Utility Systems, and Other Facilities:** The Forest owns and operates approximately 136 buildings and related facilities which support the management of the Forest. These include offices, warehouses, residences, shops, and mess halls. Approximately 62 potable water systems and 124 waste water systems presently serve both recreation and administrative facilities. The Forest maintains and operates four heliports. Other facilities on the Forest include seven electric transmission lines greater than 66 KV. Two other energy projects lie on the Forest but include only diversion dams, conduits and part of one powerhouse.

9. FIRE AND FUELS MANAGEMENT

Geographic location, weather, vegetation, topography, access and human activity create a complex fire management situation in the Planning Area. The Sequoia NF has an average of 200 fires each year which burn an average of 10,305 acres. About 67 percent of the fires are caused by lightning. The balance are caused by Forest visitors, workers, and residents. The fire management organization's mission is to protect life, property, and wildland resources from wildfire.

Fuels management activities have consisted of construction and maintenance of fuelbreaks, burning of timber sale slash, and broadcast burning in both timber and brush fuels.

10. FISHERIES, WILDLIFE AND SENSITIVE PLANTS

- a. Fisheries: Containing the southernmost native trout fisheries in the Sierra Nevada, the Forest has four "golden like" trout of the Kern River drainage and possibly some remnant native rainbow trout populations. Nonnative populations of rainbows, browns and brook trout, smallmouth and largemouth bass, green sunfish, and Sacramento perch occur. A total of 24 species of fish are known on the Forest.
- b. Wildlife: The variety of wildlife species is closely related to the diversity of habitats available. The Planning Area offers several broad ecosystems, each of which provides a variety of habitats for 85 species of mammals, 194 species of birds, 25 of reptiles and 11 of amphibians. Because of the losses of habitat outside the Forest due to urbanization, wildlife species are becoming more dependent upon the Forest to supply their life requirements.
- c. Sensitive Plants: The Sequoia NF contains over 2,000 species of plants, comprising over one-fourth of the State's flora. Of this total, 23 species are considered sensitive and are listed by the Regional Forester as requiring special management attention. At this time, no plants on the Sequoia NF are federally listed as threatened or endangered. Under the California Endangered Species Act, three species are listed as endangered. Under the California Native Plant Protection Act, three species are listed as rare.

11. FURTHER PLANNING AREAS

Further Planning Areas are unroaded lands which are at least 5,000 acres or of any size if they are contiguous to an existing classified wilderness. These areas are evaluated and recommended for either wilderness or non-wilderness designation. Four National Forest areas (totalling about 91,460 acres) and one Bureau of Land Management area (35,560 acres) are evaluated in this document.

12. HUMAN RESOURCES PROGRAM

In 1982, there were 1,065 individuals employed through Human Resource Programs on the Sequoia NF. Program participants have worked in a wide range of Forest operations including trail maintenance, meadow restoration, fire suppression and prevention, facilities and vehicle maintenance, timber stand improvement projects, drafting, data processing, clerical work, and warehousing.

13. INTEGRATED PEST MANAGEMENT

There is no indication of current "epidemics" occurring on the Sequoia National Forest. With the exception of the 1975-77 drought/insect/disease-related tree mortality, catastrophic mortality situations have not been encountered on the Forest within the last 10-15 years. Common pests on the Forest include: root diseases, White Pine Blister Rust, dwarf and true mistletoes, bark beetles, and pocket gophers.

14. LANDS

- a. Landownership Adjustments: There are approximately 54,000 acres of privately or State owned land within the boundaries of the Sequoia NF. It consists of many small, scattered parcels. Their effect on management activities, while locally intense, does not have the major effects common on other, less well-consolidated forests. Landownership adjustment is a long-range program and the Sequoia NF will only consider dealing with willing proponents.
- b. Land Line Location: There are over 700 miles of boundary line between public and private land located within and adjacent to the Sequoia National Forest. Encroachments onto Forest land from private land activities are an increasing problem. The management solution has been to embark on a 20-year project to mark and post all boundary lines.
- c. Rights-of-Way Acquisition: The Sequoia National Forest's rights-of-way program has concentrated on timber access roads. Existing Forest System roads and trails cross the land of over 30 private landowners without rights-of-way and total about 45 miles.
- d. Non-Recreation Special Uses: Use of approximately 2,150 acres of Sequoia National Forest is authorized by about 280 special-use permits. These permits allow occupancy and use by the private sector and local governments. Permits are for agricultural, industrial, public information, transportation, utilities, communications and water uses.

15. LAW ENFORCEMENT

Law enforcement is a concern because of the potential for injury to employees and visitors, and the potential for losses, damages and costs to the natural resources and property. In areas of highly concentrated recreation use (such as the Kern Canyon, Lloyd Meadows Road, and Coffee Camp), law enforcement problems occur. These include vandalism, theft and destruction of government property, wildland arson and occupancy trespass. There also has recently been an increase in the illegal use of National Forest System lands for the cultivation of marijuana.

16. MINERALS AND GEOLOGY

Geologically, the Forest is dominated by granitic rocks with small regions of metamorphic rocks. Volcanic rocks are rare. Mining activity is primarily associated with the metamorphic rocks. Currently there are about

five small mines in operation on public ~~or~~ private land within the Forest boundary.

Past mining activity has been mainly for gold, uranium, and tungsten. Combining the mineral potentials for these three minerals into a rating system, the Forest has about 170,000 acres of low, 670,000 acres of medium and 335,000 acres of very high/high overall potential.

Rock aggregate and decomposed granite are the most abundant forms of saleable mineral material for construction. Some hard rock granite is available for making aggregate; but the quality is not high.

Possible geothermal resources occur along the Kern Canyon, near Monache Meadows, at California Hot Springs, and along the eastern edge of the Forest. Oil and gas and other leasable mineral potential is low.

17. NATIONAL NATURAL LANDMARKS

Eleven candidates were identified through the National Park Service theme studies. These are sites which potentially represent a particular niche in the ecological ~~or~~ geological character of the United States. Of these, four are within potential Research Natural Areas ~~or~~ Botanical Areas; and one is within an existing Botanical Area.

18. OFFICE OF INFORMATION AND INTERPRETIVE SERVICES

The Office of Information and Interpretive Services provides an important communication link between Forest managers and the public. The Forest is within one hours drive of Fresno and Bakersfield and three and one-half hours drive of the Los Angeles Basin. Hispanics make up a large portion of the user group of the Western Foothills and Kern River. The Forest currently provides bilingual information programs and regularly contacts the Hispanic media.

Current management direction is as follows:

- 1) Provide opportunities for visitors and potential visitors to get basic information about the Forest;
- 2) Provide on-the-ground interpretation and visitor contact in areas of heavy use;
- 3) ~~Make~~ the Forest visitor's stay a more enjoyable and meaningful experience; and
- 4) Assist resource management objectives through public understanding.

LIVESTOCK GRAZING

Grazing management programs on the Forest cover about **1.01** million acres of grassland, chaparral, and open forests. Of this total acreage, **171,000** acres are suitable for use by livestock. This large area is divided into approximately 55 allotments, located in three counties. Forty-seven paid permits are issued annually to permittees to graze about **69,000** Animal Unit Months (AUM's).

Current management activities include general administration and range improvement. General administration involves the inventory of range resources, the determination of grazing potentials, the designation of livestock grazing allotments, the granting of permits, and the inspection and administration of livestock grazing. Range improvement practices include fencing and water development, prescribed burning, brush control, thinning of timber stands, control of animal pests, draining, and fertilization.

19. RECREATION

The Planning Area offers a broad spectrum of recreational opportunities and settings for all seasons of the year. Principal outdoor recreation activities include camping, motorized travel, water-related activities, hiking, horseback riding, and resort recreation residence use. In **1982**, the Sequoia NF received nearly 2.5 million Recreation Visitor Days (36 percent occurred in developed sites and 64 percent in dispersed areas). Four percent of the recreation use was in designated wildernesses. Approximately **90** percent of the use originated from the southern California counties of Los Angeles, Riverside, San Bernardino, San Diego, and Santa Barbara. There is increasing demand for water-related and snow-related recreational opportunities as well as for dispersed motorized vehicle activities.

20. RESEARCH NATURAL AREAS

Research Natural Areas typify important natural ecological or geological types that have special unique characteristics of scientific interest or importance. There are no Research Natural Areas currently established on the Sequoia NF. Three areas are identified to represent the Jeffrey pine, red fir and giant sequoia target elements. One area has been identified as a potential candidate for the conifer woodland element. These areas are recommended for advancement to final establishment status.

21. SPECIAL INTEREST AREAS

Special Interest Areas (SIA's) are designated because of their unusual or outstanding scenic, cultural, scientific, natural or other unique characteristics which merit special attention and management. There are two existing SIA's on the Forest, the Bodfish Piute Cypress Botanical Area and the Packsaddle Cave Geologic Area. All five Botanical Areas analyzed in the FEIS are established.

22. URBAN INTERFACE

The urban interface is an area of human settlement on private land, contiguous to the Forest, and developed or potentially developable to a density comparable to conventional subdivisions. The Forest has identified several urban interface areas on the basis of visual resources and increased fire prevention and suppression needs. These include many of the communities within or near the Forest boundary.

23. VEGETATIONMANAGEMENT

- a. **Chaparral:** There are 245,700 acres classed as chaparral in the Planning Area. About 25 percent is Montane chaparral while the remainder is a mixed chaparral. Of this latter type, approximately 75 percent is in late or mature-to-decadent seral stages. The brush is dense, often virtually impenetrable, and has high dead-to-live fuel ratios.
- b. **Giant Sequoia:** Giant sequoia or Sierra redwood (Sequoiadendron giganteum) grows in mixed conifer forests on the western slope of the Sierra Nevada at elevations ranging from 5,000 to 8,000 feet. Thirty-eight groves (totaling approximately 13,200 acres) are scattered within the Forest. Current management direction is to preserve the species and individual old growth trees for public enjoyment .
- c. **Meadows:** The Forest currently has approximately 7,540 acres of mountain meadows ranging in size from about two acres to several hundred acres. These lie within the boundaries of the conifer ecosystem and represent less than two percent of that ecosystem's **gross** acreage. Mountain meadows are important for the production of livestock, maintenance of wildlife populations, the grazing of recreation and administrative stock. Meadows provide scenic vistas. Their timbered edges are favored campsites of Forest visitors. Also, meadows serve to filter sediment and bacteria from the water to provide clean water for human use and fish habitat.
- d. **Riparian Areas:** The riparian area includes as the aquatic ecosystem, riparian vegetation, 100-year floodplain and Streamside Management Zone. They are important to a number of Forest resources by providing water quality protection, fish and wildlife habitat, visual contrast, and a fire barrier. The hardwoods supply firewood and the softwoods provide timber. The water and meadows attract livestock. Recreation opportunities are intensely pursued along streams and in the flat areas adjacent to them.
- e. **Timber:** Of approximately 531,000 acres inventoried as containing conifers, 420.00 acres are classified as tentatively suitable for timber production. Under current management direction, the potential yield for the Forest is 95 million board feet per year. Timber is managed under the even-aged system, incorporating such harvest practices as clearcutting, shelterwood and selection methods. Modified even-aged practices are used where timber

production is not the dominant use, such as at recreation sites, visually sensitive areas or in critical wildlife habitat.

Regeneration of the forest is done by planting seedling trees or allowing natural seeding. In order to assure survival and tree growth, it is necessary to protect the seedlings from insects, disease, fire and competing vegetation.

- f. **Woodlands:** Woodlands on the Planning Area are divided into various *oak* and pinyon pine woodlands. Black *oak* woodlands lie between the mixed chaparral and conifer forests and are primarily located on the western slope of the Forest. They comprise about 45,900 acres on the Forest. Black *oak* is used for firewood and produces mast (acorns) and habitat for deer and other wildlife species.

The blue *oak* woodland occurs only on the western fringe of the Forest between the floor of the San Joaquin Valley and the mixed chaparral. This woodland has traditionally been used for range production due to the extensive annual grass understory and the proximity to cattle ranches in the Valley.

Live *oak* woodland generally occurs on steep, rocky slopes and covers 124,100 acres of the Sequoia NF. Live *oak* is an evergreen *oak* which grows in relatively pure stands. There has been little utilization of this woodland by wildlife, livestock, or recreationists.

Pinyon pine woodlands are found on the eastern portion of the Piutes and the Kern Plateau and on the Scodie Mountains. They cover approximately 100,600 acres of the Planning Area. Use of the area has been primarily by people who use off-highway vehicles, hunt, or gather pinyon nuts.

24. VISUAL RESOURCES

The Planning Area offers a wide range of scenic features that include desert-like, foothill, and mid-to-high elevation landscapes. Some of the outstanding visual attractions are the Kings River Canyon, the Little Kern River, Farewell Gap, the Needles, and Dome Rock. State Highways 180 and 190 have been designated as eligible as State Scenic Highways. Current estimates are that five percent of the Planning Area has an altered appearance.

25. WILD AND SCENIC RIVERS

The National Rivers Inventory of 1982 identified three rivers on the Sequoia NF which may be suitable for inclusion in the National Wild and Scenic River System. These rivers, the South Fork of the Kern River, the Kings River, and the South Fork of the Kings River, were considered in the planning process. In addition, the North Fork Kern River was identified for study as a possible candidate by an Amendment (PL 95-625, November 10, 1978) to the Wild and Scenic River Act. A final environmental statement was completed, the report was evaluated by the Office of Management and

Budget, and a recommendation was made by the President. Legislation designating all or portions of each of these rivers was enacted into law in November, 1987.

26. WILDERNESS

Five wildernesses comprised of 264.071 acres have been designated by Congress in the Sequoia NF. This is approximately 24 percent of the Forest. These are the Golden Trout, Dome Lands, Monarch, South Sierra, and Jennie Lakes Wildernesses.

D. ENVIRONMENTAL CONSEQUENCES (FEIS. Chapter 4)

This is a brief summary of the key environmental consequences. The intent is to highlight the major consequences of the alternatives and the differences between them.

1. SOCIOECONOMIC

Because of expanded economic and recreational opportunities under the PRF, MKT, and PRO Alternatives, all local groups except Native Americans would be better off. Native Americans would experience no change. Under the RPA and WFFV Alternatives, ranchers would have fewer AUM's, but all other groups would be better off. Only recreational day users would be better off under the AMN Alternative. There is negligible change under the CUR Alternative.

2. AIR QUALITY

The projected acreage that would be burned by wildfire, acreage burned by prescribed fire and a comparison of recreational visitor days (RVD's) in developed recreation are used to assess the consequences of the alternative. In each of six alternatives (PRF, AMN, MKT, PRO, RPA, WFFV), there will be a steady increase, to a relatively high level, of developed recreation and wildfire. This will result in periodically reduced visibility and lowered air quality. In CUR, there will be a moderate increase, to a relatively low level, of developed recreation and wildfire. This will result in brief periods of lowered air quality.

3. CULTURAL RESOURCES

The three key indicators of the direct and indirect effects of an alternative on cultural resources are acres of timber harvest, anticipated number of mineral operating plans, and miles of road construction and reconstruction. The AMN poses the lowest potential threat while the PRO poses the greatest potential threat. The MKT, falls somewhat below PRO in potential for adverse impact. The RPA, PRF, WFFV, and CUR are in the middle-to-lower end of the mid-range in terms of their potential to adversely affect cultural resources.

4. DIVERSITY

Timber management practices and the use of prescribed fire are the indicators which can influence diversity. In the chaparral and conifer

zones, diversity would increase slightly under PRF. In the CUR, chaparral would remain stable to moderately improved and the conifer would improve. Under RPA, species diversity in chaparral would increase to the greatest extent in the early stages: the conifer forest would remain about the same as the 1982 level. Diversity in chaparral would increase in the AMN, but the conifer would decline. For MKT and PRO, there would be an increase of total species diversity with a dramatic change in conifer to the young seral stages early in the planning period. Under WFV, species mix would increase in chaparral and diversity would be high in the conifer.

5. EARTH RESOURCES

- a. **Soil Productivity:** Indicators of potential effects on soil productivity are both positive (soil protection and improvement activities) and negative (soil disturbing activities). Due to moderate-to-low amounts of soil disturbances from timber harvest and/or moderate-to-high amounts of prescribed fire, maintenance of long-term productivity, with overall positive effects on the soil resource, is expected under the PRF, CUR, RPA, AMN, and WFV Alternatives.

The MKT and PRO Alternatives also have an overall positive effect on the soil resource. Due to the lower difference between the positive and negative effects over the first three decades, the long-term soil productivity will be lower than with other alternatives.

- b. **Water Yield:** Chaparral treatment and timber harvest are indicators of increases in water yield. At about three percent above present levels, Alternatives PRO and MKT show the greatest increases in water yield for the first decade. PRF follows with a two percent increase and RPA with a one percent increase in water yield. CUR, AMN, and WFV have negligible effects on water yield.
- c. **cumulative Watershed Effects:** Generally, management activities have similar effects on soil and watershed condition. For the purpose of this discussion, they will be considered together. Each of the alternatives has been designed to protect the basic soil productivity and to meet applicable water quality standards. However, implementation of the various alternatives produce differing impacts on soil and watershed condition. Equivalent Roded Acres (ERA's) are used to measure the Cumulative Watershed Effects of the amount and intensity of disturbance resulting under each alternative. The relationship of ERA's to the watershed threshold, or upper tolerance limit, may be used to compare the relative effects of the alternatives on soils and watershed.

CUMULATIVE WATERSHED EFFECTS
AS A PERCENT OF EQUIVALENT ROADED ACRES CONSUMED BY VARIOUS ALTERNATIVE

DECADE	WATERSHED THRESHOLD	PRF	CUR	RPA	AMN	MKT	PRO	WFV
1	100	55	88	71	18	87	90	42
2	100	56	90	72	18	89	92	43
3	100	57	87	85	29	100	99	95
4	100	69	96	94	34	95	95	62
5	100	75	97	93	33	100	99	58

6. FISHERIES

The consequences of the alternatives are measured by the designation and treatment of the Streamside Management Zone, the amount of cumulative watershed disturbance, and the miles of potentially affected streams. The results show that in PRF, CUR, MKT, and PRO, the physical limiting factors are unchanged and native trout production will remain constant. For WFV, AMN, and RPA structural habitat improvements will result in a one to two percent increase in the pounds of trout produced.

7. WILDLIFE

Activities associated with the special management direction of each alternative are the indicators used to predict the availability of potential habitats used by the various species groups on the Forest.

The increase (+) or decrease (-) of potential habitat are listed for each species group in the following order: species associated with early successional stages, with late successional stages, and with mast production. By alternative, the projections show:

PRF +15%, -10%, -10%
 CUR +10%, -10%, -10%
 RPA +10%, -10%, -10%
 AMN +10%, -05%, -02%
 MKT +10%, -17%, -10%
 PRO +12%, -25%, -15%
 WFV +13%, -15%, -10%

8. FURTHER PLANNING AREAS AND BLM WILDERNESS STUDY AREA

The maximum potential for wilderness within the planning unit is approximately 392,000 acres. This includes all existing wildernesses and Further Planning Areas (including the BLM Rockhouse WSA which is immediately adjacent to the National Forest boundary and the existing Dome Land Wilderness). It does not include the Kings River area, which has since been allocated by Congress, or the Cypress area, which was addressed by the BLM.

9. WILDERNESS

Oat Mountain, Dennison. Moses, BLM Rockhouse. and Scodies, (totalling **127,020** acres) constitute the five Further Planning and Wilderness Study Areas evaluated for recommendation for inclusion in the National Wilderness Preservation System. *AMN* recommends that all five be included in that system. *RPA* recommends **12,650** acres of BLM Rockhouse; *PRF*, **12,500** acres of BLM Rockhouse; and *MKT*, **9,710** acres of BLM Rockhouse. Finally, *WFV*, *CUR* and *PRO* recommend no additional acres for wilderness designation.

In all alternatives, those Further Planning and Wilderness Study Areas not recommended for wilderness would be allocated to non-wilderness management. As such, they would lose some or all of their wilderness characteristics as more management practices are implemented. Recognizing that rugged terrain would limit many opportunities, uses possible in these areas include *OHV* and other dispersed recreation, timber management, wildlife and range habitat improvement, and measures to improve water yield.

10. LIVESTOCK GRAZING

Dispersed recreation and new road construction have the greatest effect on the grazing environment. Generally, forage production remains at current levels in *CUR*, *PRF* and *WFV*; increases in *MKT* and *PRO*; and decreases in *RPA* and *AMN*. The demand for forage is met in *PRF*, *CUR*, *WFV*, *MKT*, *PRO*; but demand exceeds supply in *RPA* and *AMN*.

11. RECREATION

The quality and opportunity for recreational experiences, and accessibility are compared to demonstrate the key differences between the alternatives. Except for *CUR* and *RPA*, demand for dispersed recreation will be met in all alternatives. Demand for developed recreation will be met in *AMN* and *MKT*. Opportunities for high quality dispersed recreation will occur in *PRF*, *RPA*, and *AMN*. Opportunities for high quality developed recreation will be available in *MKT*, *PRO* and *WFV*. Access to and through the Forest increases in every alternative.

12. VEGETATION

- a. **Chaparral:** The indicators which strongly influence chaparral are the use of prescribed fire, wildfire, grazing, and mechanical treatments. In *PRF*, *AMN*, *RPA*, *WFV*, and *CUR*, productivity and diversity increase until the fourth decade when they are maintained. About 40 percent will be in early successional stages. The *MKT* and *PRO* Alternatives show a decline in productivity and diversity through the fourth decade, then an increase in the fifth to near maximum production. Sixty percent is in early successional stages at the end of the fifth decade.
- b. **Giant Sequoia:** Acres of giant sequoia are allocated to one of three management categories, Intensive, Non-intensive, and Preservation. *PRF* establishes approximate acres for each grove and management category. These are: Preservation, 1600 acres:

Non-intensive, 7500 acres: and Intensive, 4100 acres. A Giant Sequoia Management Implementation Plan will be developed under NEPA procedures and incorporated into the Forest Plan as an amendment.

For the remaining alternatives, approximate acreages allocated to Preservation, Non-intensive, and Intensive management categories are as follows: WFV - 3,000, 9,000, and 1,000; CUR - 9,000, 3,000 and 1,000; RPA - 2,000, 10,000, and 1,000; MKT and PRO - 1,000, 11,000, and 1,000 acres; AMN - 6,000 and 1,000

- c. **Meadows:** Accelerated runoff from surrounding watershed lands can damage meadow ecosystems. Recreation facilities, vegetative manipulation, overuse by livestock, transportation systems, and recreation use can increase or concentrate runoff. These changes in runoff characteristics accelerate channel gullying which lead to ecosystem instability and reduced productivity.

Under PRF, CUR and WFV, the overall effect would vary from the present level of management to an improvement of condition. New road construction would decline by 20 percent, as measured on a miles of road per acre basis. This would result in less of an increase in gullying in meadows caused by roads. Under MKT and PRO, relatively little watershed restoration activity, compared to the large increases in road construction and moderate-to-large increases in water flow, would add to the overall likelihood of accelerated gully formation in meadows. As a result, plant productivity would be reduced.

AMN and RPA provide for the greatest watershed restoration activity among all alternatives. With Forest-wide OHV restriction and little or no increase in water flow, the likelihood of drainage pattern changes and gullying will be reduced substantially.

- d. **Riparian Areas:** Riparian areas are affected primarily by resource activities, such as timber harvesting, livestock foraging, recreation, and prescribed fire. The effects of these activities can be mitigated by protecting the characteristics of the stream and nearby land - the Streamside Management Zone.

For all alternatives, this protection is accounted for by considering **only** selective harvest in the Streamside Management Zone (SMZ). This selective harvest would treat five percent or less of the timber in the SMZ. A 100-foot distance from each side of the stream's edge will delineate the SMZ. This delineation accounts for approximately 12,850 acres of CAS land.

- e. **Oak Woodland:** Under all alternatives, small acreage treatments for the black and live oak types result in no change to slight increases in seedling establishment and diversity. Blue **oaks** would continue unchanged throughout the planning period.

- f. **Pinyon-Sage:** Prescribed fire use, firewood cutting, and OHV use influence diversity and habitat quality.

For PRF, CUR, RPA, WFV, MKT, and PRO, diversity would remain approximately unchanged during the planning period for the pinyon component. Habitat quality declines throughout the ecosystem due to increased soil compaction, soil **loss**, and overall degradation of habitat due to greater OHV use. For AMN, diversity would remain approximately unchanged.

- g. **CONIFER:** Three principle factors guide conifer management on the 420,000 acres of land estimated to be tentatively suitable for timber production: economic growth and yield, provisions for diversity, and maintenance of a healthy forest where timber harvest is not a primary objective. As management emphasis shifts between alternatives, the acres found suitable for timber production also shift. For example, the PRF has the **greatest** amount of suitable land with 345,000 acres. RPA, PRO, AND MKT follow with 330,000, 326,000, and 305,000 acres, respectively. The three alternatives that have the least are CUR, AMN, AND WFV with 298,000, 280,000, and 271,000 acres, respectively.

In addition to the number of suitable acres, the intensity of timber production shifts between alternatives. The PRO and MKT assign the greatest amount of land to Regulation Class I (the most intensive harvest classification) with the former 86 percent and the latter 81 percent of the suitable landbase. In descending order, the PRF and CUR place 64 and 62 percent in this class while RPA places 44 percent. Neither the AMN nor WFV assign acres to Regulation Class I.

Uneven-aged management is used exclusively in the AMN and on about 50 percent of the suitable landbase in the WFV. About 20 percent of the land used in PRF is managed under uneven-aged systems. The RPA applies uneven-aged management in the form of Regulation Class III on 30 percent of that alternative's suitable landbase. The remaining four alternatives (PRF, CUR, MKT, AND PRO) use even-aged management extensively on both Regulation Class I and II lands.

13. FACILITIES

The transportation system proposed under each alternative is developed in response to resource management demands. New construction is primarily related to timber management. Road closures are related to ability to maintain and the demand on the resources they access. Under MKT and PRO, expansion of recreation opportunities and increased emphasis on commodity production result in extension of the road system and an increase in road mileage available for public use. Under PRF, CUR and RPA, there would be relatively moderate road construction and road mileage available for public use. The AMN Alternative produces few new roads and road mileage available to the public is significantly increased. The WFV Alternative varies little from current levels and would have a moderate amount of roads available for public use.

14. VISUAL RESOURCES

Timber management with associated road building produces the greatest changes to the natural character of the landscape. The AMN and WFV result in 100 percent of the Forest with the natural landscape character dominant. The PRF and RPA have 77 percent and 76 percent respectively, while CUR shows 71 percent. The two alternatives with the greatest impacts are MKT and PRO, resulting in 64 percent and 59 percent respectively of the natural landscape character dominant.

All alternatives, except AMN, have approximately 24 percent of the Forest land base in the Preservation VQO. The AMN has nearly 32 percent.

15. WILD AND SCENIC RIVERS

Enactment of HR799 in November 1987, designated all but one segment of the Kings River as Wild and Scenic. Segment 1 and its surrounding area, the Kings River Further Planning Area, were designated as a Special Management Area. It will be managed according to a management plan which will be incorporated into the Forest Plan as an amendment. Separate legislation designated the North and South Forks of the Kern as Wild and Scenic.