

**MOUNTAIN HOME DEMONSTRATION STATE FOREST  
MANAGEMENT PLAN**

**Tulare County  
California**

**2003**

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State of California  
DEPARTMENT OF FORESTRY AND FIRE PROTECTION  
California Southern Region



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## I. INTRODUCTION

### I-A. Authority and Statutes

The legislative authority for the State Forest System is contained in Public Resources Code (PRC) §4631-4658. The California Department of Forestry and Fire Protection (CDF) is responsible for the management of Mountain Home Demonstration State Forest (MHDSF). As part of this oversight, the MHDSF staff operates under a management plan, which provides general objectives and goals. The plan is required pursuant to Public Resources Code §4645 and Article 8 of the State Board of Forestry and Fire Protection (Board) policy.

The legislation under which the Mountain Home Tract was acquired provided that the forest be preserved "as nearly as possible in a virgin state" and that the forest be used for public hunting, fishing, and recreation. The original legislation was not clear as to whether timber cutting was permitted on the forest. It was amended in 1947 to allow timber sales. The amended statute under which MHDSF is managed is found in Section 4658 of the Public Resources Code. It reads, "The Mountain Home Tract Forest in Tulare County shall be developed and maintained, pursuant to this chapter, as a multiple-use forest, primarily for public hunting, fishing, and recreation. In future acquisitions and exchanges of land, as provided by law, the acreage in state ownership shall not be reduced below 4000 acres."

Chapter 9 of Title 14 of the California Code of Regulations contains rules and regulations governing the recreational use and the sale of timber and other forest products.

Policy direction, which is provided by the State Board of Forestry, states: "The primary purpose of the State Forest program is to conduct innovative demonstrations, experiments, and education in forest management. All State Forest land uses should serve this purpose in some way." In addition, "timber production will be subordinate to recreation" on MHDSF.

### I-B. History

The Mountain Home Tract has a long history of timber and recreational use. People would come up to get relief from the heat of the San Joaquin Valley in the summer.

Lumbering began adjacent to the State Forest in the Happy Camp area about 1870 with the Rand-Haughton Mill. However, very little acreage was cut over until A.M. Coburn and L. B. Frasier built mills on Bear Creek in 1885. Records indicate the Coburn and Frasier mills could cut 20 MBF and 40 MBF per day respectively. Records also show Frasier was in financial trouble from the start. The Tule River Lumber Company became owners of the Frasier Mill and surrounding property in 1890.

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Mostly pine was logged until around 1900 when the Enterprise Mill constructed a log skidway and logged the giant sequoia from about 100 acres. The Elster Mill, which operated from 1903-1905, was the last of the early mills to operate

on the forest. Virtually no lumbering activity occurred from 1905 until the late 1930's.

In the early 1940's, old growth giant sequoia were again being cut at a rapid rate throughout the southern Sierra Nevada. Local residents were concerned that soon there would be few of the giants remaining. In the Fresno-Visalia area, the Native Sons and Daughters of the Golden West made a special project of saving the mammoth trees of the Mountain Home Tract. As a result of their efforts, the California State Legislature passed the enabling legislation for the purchase of the Mountain Home Tract, under Senate Bill #934 in 1945. The Tule River Lumber Company, and the well-known Michigan lumberman, George Hume, had consolidated this tract between 1890 and 1915. The Michigan Trust Company controlled this land later. In 1946, the owners sold the Mountain Home Tract for \$548,762 to the State of California.

#### I-C General Management Goals

Listed below are the Management Goals for the State Forest ranked as to importance in Forest management activities. In many management decisions, the different goals will carry equal or similar weights. It would be impossible to totally reach any one stated goal without conflicting with or impacting the others. The objectives outlined in this plan take this into account by striking a balance in an effort to optimize as many of these goals as possible.

##### First Priority

Recreation - Provide for recreational opportunities as the primary use of the State Forest. Develop a system of campgrounds, picnic areas, trails, and roads at a level commensurate with use. Maintain these facilities in such a manner as to provide for safe and enjoyable use.

Unique, Historical and Archaeological Features – Develop an inventory of all cultural resources on the forest and provide for protection of those areas during all management activities. Encourage research and interpretive use of these sites.

##### Second Priority

Timber – Optimize volume production on all productive acres while at the same time maintaining or enhancing the recreational values. Harvest this timber by the most economical methods, which will protect the environmental values and maintain site productivity. Ensure prompt regeneration following cutting and most economical methods, which will protect the environmental values and maintain site productivity. Ensure prompt regeneration following cutting and maintenance of optimum stocking throughout the stand life. Protect old growth giant sequoia from cutting and logging damage, and encourage giant sequoia reproduction.

Experiments and Demonstrations - Undertake an ongoing program of experimental work with emphasis on reforestation, giant sequoia management, recreation, mitigation of environmental damage from harvesting activities, and forest pests. Disseminate information concerning

## I-C. Management Goals – continued

management activities and experimental work by all means that will maximize the exposure to interested individuals and groups.

Education - Conduct an active educational program to explain the Forest Management activities undertaken on the State Forest to as large an audience as feasible. This audience should include a large cross section of ages, education and social backgrounds.

### Third Priority

Other Forest Products - Optimize the use of dead and down trees, slash, bark, cull logs, and precommercial thinning for fuelwood, posts, pulpwood, and other specialty products. Utilize dead and down giant sequoia by both small sales and through CDF use while protecting the recreational and scientific value of selected specimens. Make cone collections to satisfy the needs of the State nursery system and make sales of the excess to private collectors.

Water Resources - Increase water yield by timber harvesting and vegetative management while maintaining water quality. Develop water sources, mainly springs, for use at administrative and recreational facilities and assure safe drinking water for such use.

Soil - Reduce degradation of soils by erosion, compaction, and nutrient loss.

Fish and Wildlife - Enhance the existing habitat for as many wildlife species as possible. Manage cover, food and water in such a way as to sustain or increase wildlife populations. Prevent the degradation of stream and pond habitat that is suitable for fish populations.

Aesthetics - Use different management strategies to maintain an aesthetically pleasing forest environment for the recreational visitor. Use timber harvesting to advantage in increasing the visibility of old growth giant sequoia. Improve the aesthetics in areas along roads and with high recreational use by controlling the density of leave stands, prompt slash disposal and rapid regeneration.

I-C. Management Goals – continued

Fire Prevention and Protection – Reduce damage from wildfire with a coordinated fire prevention and protection system including: Education, enforcement, patrol, vegetation management, fuelbreaks, pre-attack, and suppression.

Forest Pests – Reduce the impact of forest pests by monitoring status of pest populations, utilizing prompt and established control methods, with immediate salvage of mortality.

II. PHYSICAL PROPERTY DESCRIPTION

II-A. Property Description

Mountain Home Demonstration State Forest is located in Tulare County, some 22 air miles northeast of Porterville (See Map Appendix E-1, E-2). The forest is situated in the drainages of the North Fork and the North Fork of the Middle Fork of the Tule River. Elevations range from 4800 feet to 7600 feet.

Total area of the Forest is 4,807 acres. This acreage is based on the original survey made in 1874-1882, adjusted by more recent survey information.

As more of the forest becomes surveyed, the acreage figures will be adjusted to a more accurate figure. Acreage figures by legal subdivision are as follows:

Section 24T19S R30E .....	80	acres
Section 25T19S R30E .....	583	acres
Section 26 T19S R30E .....	400	acres
Section 34T19S R30E .....	410	acres
Section 35T19S R30E .....	120	acres
Section 36T19S R30E .....	480	acres
Section 18T19S R31E .....	133	acres
Section 19T19S R31E .....	418	acres
Section 20T19S R31E .....	44	acres
Section 28T19S R31E .....	43	acres
Section 29T19S R31E .....	395	acres
Section 30T19S R31E .....	602	acres
Section 31T19S R31E .....	294	acres
Section 1T20S R30E .....	480	acres
Section 2T20S R30E .....	160	acres
Section 12T20S R30E .....	80	acres
Section 6T20S E31E .....	85	acres

## II-B. Adjacent Ownerships

Owners both adjacent to and within the boundaries of the State Forest include: Tulare County Parks Department, U.S. Forest Service, and private individuals. The 160-acre County-owned Balch Park lies almost entirely within the State Forest in Sections 1 and 36. Of the approximately 30 miles of exterior boundary on the forest, 24-1/2 miles are common with the U.S. Forest Service, 3 miles common with private owners, and 2-1/2 miles common with Tulare County.

## II-C. Zoning

The entire State Forest is classified as a Timber Production Zone (TPZ). Land is valued by timber site class according to rates established by the State Board of Equalization. Use of the land is restricted to timber production and certain other "compatible uses". Compatible uses of land in timber production zones are limited to all uses which "do not significantly detract from the use of the property for, or inhibit, growing and harvesting Timber".

## II-D. Boundaries

Approximately 28% of the State Forest boundaries remain un-surveyed. The un-surveyed boundaries lie within T19S, R30E and T20S, R30E. The establishment of the line within the latter township will require starting from known corners near the town of Springville. The original 1882 survey was fraudulent with many of the corners not surveyed.

Timber harvesting has been accomplished in the area with informal cutting line agreements with the USDA Forest Service, the only adjacent landowner in the area. Land use restrictions by the USDA Forest Service on adjacent land and plans for more intensive management of the area require a complete survey of the remaining un-surveyed lines to accurately establish the boundaries of the forest. Surveys of the remaining unknown boundaries of the State Forest should be accomplished as soon as possible. Since the other major property owner benefiting from this survey is the USDA Forest Service, an effort should be made to accomplish this survey in a cooperative manner.

## Management Guidelines

The survey of T19S, R31E, started in 1983, and was completed in 1990. This has provided the Forest Staff the ability to implement projects with the confidence that they are operating on State Property. All known section corners and property lines should be protected and maintained on a regular schedule.

## II-E. Climate

Climate of the area is characterized by dry, warm summers and cold, wet winters. Average precipitation, based on nearby weather stations and partial weather records on the forest, is estimated to be 40 inches per year.

Summer rainfall, in the form of isolated thundershowers, occurs sporadically and unpredictably. Winter precipitation occurs mostly in the form of snow with occasional warm rains. Average date of the first snowfall is approximately November 1. April 1 average water content of snow at the Old Enterprise Mill Snow Course, elevation 6600 feet, is 15.3inches with an average depth of approximately 36.9 inches.

Average maximum and minimum temperatures by month are as follows:

	<u>Max. Temp. F.</u>	<u>Min. Temp. F.</u>
January	51	17
February	57	16
March	60	17
April	60	23
May	62	26
June	75	40
July	82	45
August	81	39
September	76	35
October	67	30
November	56	20
December	51	18

II-F. Soils and Geology (See Map Appendix E-6)

Approximately 2/3 of the State forest area is underlain by granite-granodiorite, most of which is decomposed at the surface. The remaining 1/3 of the area is underlain by metamorphic rocks including schists, quartzite, slate, metavolcanic rocks, limesilicate hornfels and limestone. The main ridge between the North Fork and the North Fork of the Middle Fork of the Tule River forms the rough dividing line between these two basic parent materials. The granitics lie to the west of the ridge with the metamorphics to the east.

Known mineral commodities of possible economic value in the area include: (1) Miscellaneous crushed rock, (2) Limestone, (3) decomposed granite for road surfacing, (4) complex copper-zinc ore with minor amounts of lead, silver, and gold, (5) lead-zinc silver ore with minor amounts of gold, and (6) tungsten. All known occurrences of metallic minerals are restricted to the metamorphic rocks, particularly the limestone and limey horizons in the slates. Insufficient development work has been done on all mineral prospects in the area to determine whether ore is present in commercial quantities. The State holds all of the mineral rights on the State Forest and current policy prohibits prospecting by private individuals.

Thirteen soil series have been identified on the State Forest area as listed below:

Soil Series of Mountain Home Demonstration State Forest

<u>Series Name</u>	<u>Map Number</u>
Boomer	7118
Chaix	7158
Cieneba	787
Crouch	7113
Decy	8133
Dome	7186
Heitz Taxadjunct	7133M
Holland	716
Holland Taxadjunct	716M
Marpa Variant	811V
Sheetiron	820
Sierra Variant 2	757V2
Tollhouse Variant	784V

Erosion hazard for all soil series is shown in Illustration II-F-1. The erosion hazard was determined by using procedures outlined in the California Forest Practice rules. The major high-site timber producing soils exhibit moderate to high erosion hazard, depending on slope. Some of the more shallow granitic soils may exhibit high to extreme erosion hazard on steep slopes. Caution should be exercised when planning harvesting activities on slopes over 30-40% for these shallow granitics.

Areas of geologic instability, such as slides and slumps, are usually associated with high amounts of surface water and springs. These areas should be avoided in harvesting and road construction.

II-G. Water Resources

Two man-made ponds exist on or partially on State Forest land. Hedrick Pond, located near the center of Section 36, T19S, R30E, is an old mill pond constructed in 1939. Hedrick's sawmill was abandoned not long after State acquisition of the forest, but the pond remained and is now the focal point of a 14-unit campground. Hedrick Pond is near the headwaters of Coburn Creek, a tributary of Bear Creek. Another pond, located in the NE 1/4, Section 1, T20S, R30E, is partially on State Forest land and partially on Tulare County land at Balch Park. The pond was constructed in 1959 for recreational purposes. Balch Park campground is immediately adjacent to the pond on the north side.

The forest is situated on the ridge that separates the North Fork of the Middle Fork of the Tule River from the North Fork of the Tule River. The North Fork

of the Middle Fork of the Tule River passes through the forest for approximately 1½ miles of its length. Tributaries to the North Fork of the Tule River, which drain out of the forest, include Rancheria Creek and Bear Creek. Named tributaries to the Bear Creek include Norway Creek, Coburn Creek, and Park Fork of Bear Creek. Named tributaries of the North Fork of the Middle Fork of the Tule River, which occur on State Forest land, include Moses Gulch, Galena Creek, Silver Creek, and Shake Gulch.

Springs are common in many areas of the forest. Many of these springs have been developed for domestic water supplies for campgrounds, picnic areas, and administrative sites. Developed springs exist in the Shake Camp area, Moses Gulch, Hidden Falls, Hedrick Pond, Old Mountain Home picnic area, and State Forest Headquarters. These springs are developed as sealed systems, with no collection of overland flow.

### SOIL EROSION HAZARD

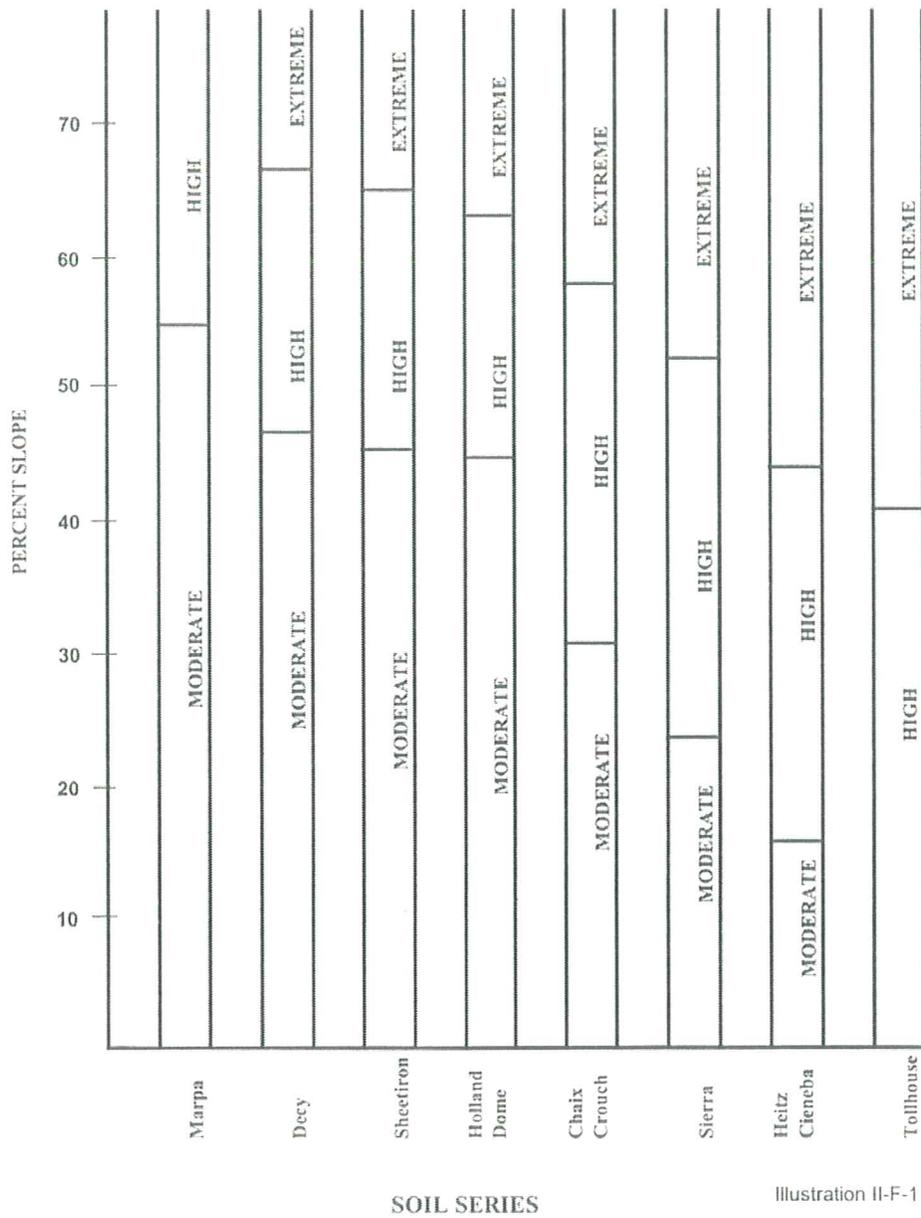


Illustration II-F-1

## II-H. Vegetation

Vegetation on the forest is dominated by a mixed conifer forest. Major tree species include: white fir (*Abies concolor*), Shasta red fir (*Abies magnifica* var. *shastensis*), sugar pine (*Pinus lambertiana*) giant sequoia (*Sequoiadendron gigantea*), ponderosa pine (*Pinus ponderosa*), incense cedar (*Calocedrus decurrens*), and black oak (*Quercus kelloggii*).

Minor tree species include: canyon live oak (*Quercus chrysolepis*), white alder (*Alnus rhombifolia*), Jeffrey pine (*Pinus jeffreyi*), and interior live oak (*Quercus wislizenii*).

Major components of the understory vegetation are listed below:

Mountain whitethorn (*Ceanothus cordulatus*), bearclover (*Chamaebatia foliolosa*), gooseberry (*Ribes roezlii*), currant (*Ribes nevadense*), California hazelnut (*Corylus cornuta* var. *californica*), bush chinquapin (*Castanopsis sempervirens*), dogwood (*Cornus nuttallii*), deerbrush (*Ceanothus integerrimus*), manzanita (*Arctostaphylos* spp.), bracken fern (*Pteridium aquilinum*), lotus (*Lotus* spp.), lupine (*Lupinus* Spp.), snowberry (*Symphoricarpos albus*), littleleaf ceanothus (*Ceanothus parvifolius*).

Old growth giant sequoia over 40 inches in DBH occurs on approximately 56% of the total acreage of the forest. Recent inventory information estimates the total number of old growth redwood trees at 4000.

Young growth giant sequoia is present in dense stands ranging in age from 1-110 years. The origin of these stands can be traced back to historical site disturbances, mainly logging. Many of these stands average 100 years in age corresponding to the early logging around 1900.

## III. RECREATION

### III-A. Existing Facilities (See Recreation Site Map, Appendix E-11)

#### Campgrounds

<u>Name</u>	<u>No. of Sites</u>	<u>Year Built</u>
Frasier Mill	49	1963
Hedrick Pond	14	1969
Shake Camp	11	1975
Hidden Falls	8	1971
Moses Gulch	10	1979

All campgrounds on the forest are based on a standard design. The basic design is rustic with accommodations for tent campers and small to medium sized, self-contained, recreational vehicles. A typical campsite consists of a stove, table, and parking space. Within a short walking distance is a garbage can, pit toilets, and running water.

Hidden Falls and a portion of the Moses Gulch campgrounds contain walk-in sites where a parking space is provided a short distance from the actual campsite. Campground roads and parking spaces are dirt with crushed rock surfacing in most cases. All campsites are available free of charge on a first-come first-served basis.

#### Group Campground – Methuselah

Methuselah Group Camp consists of a large parking area, pit toilets, fire ring, barbecue, and tables.. Capacity of the area is approximately 100 people. The group camp is available on a reservation basis, free of charge and is in very high demand.

#### Picnic Areas – Old Mountain Home and Sunset Point

Old Mountain Home picnic area has all of the facilities of a campground.

Sunset Point was converted to a picnic area in 1994 after an archaeological dig revealed the presence of a significant prehistoric Indian site. A self-guided interpretive trail was developed that is very popular with State Forest visitors.

The picnic areas are for day use only with no overnight camping permitted.

#### Overflow Areas

Camping overflow areas have been designated at the Methuselah Group Camp and at the Shake Camp public corral. These areas are used for camping only when all regular campsites are totally occupied.

#### Balch Park Pack Station

The State maintains a pack station facility in the Shake Camp area which includes living quarters, tack room and corrals. The station is leased to a private concessionaire to provide a packing service to the public. Horses and pack stock can be rented for hour rides or for extended trips into the backcountry.

#### Public Corrals

The State has constructed two sets of public corrals in the Shake Camp area. Horse trailer parking is available adjacent to the corrals.

#### Trails

All trails on the Forest are for hiking or equestrian use. No motor vehicles are allowed on any of the trail system. The system consists of trails, which are entirely within the State Forest, and trails that lead from State land into the Sequoia National Monument including the Golden Trout Wilderness Area.

#### Forestry Information Trail - One Mile

This trail is a self-guided interpretive walk, which originates at Balch Park, leads into State Forest land, and loops back into Balch Park. A trail brochure is available at the trailhead, which describes the natural history, and management activities of the area.

#### Loop Trail - Two Miles

Beginning and ending at the public corrals, this trail is suitable for short day walks or hour horseback rides. It leads through a virgin giant sequoia mixed conifer forest, past the Adam and Eve tree, Boxcar rock, Indian bathtubs, 100-year old second growth giant sequoia stands and harvest areas..

#### Redwood Crossing Trail - Two Miles

This trail originates at Shake Camp trailhead parking area and continues in and out of the State Forest land until it enters the Golden Trout Wilderness area at Redwood Crossing. This trail represents a main access point into the Golden Trout Wilderness from the State Forest and leads into backcountry areas of the Sequoia National Forest and Sequoia National Park. Wilderness permits are required for traveling on this trail beyond Redwood Crossing. The State Forest staff no longer issues wilderness permits to the general public.

#### Eastside Trail - Three Miles

This trail connects the Griswold trail with the Redwood Crossing trail at Redwood Crossing. The trail skirts along the northeast boundary of the State Forest running in and out of State land. This trail is recommended only for foot traffic because of creek crossings that are difficult for a horse to negotiate.

#### McAnlis Trail - One-half Mile

This short trail consists of a spur that connects the upper McAnlis access road east of the river with the Eastside Trail.

#### River Trail - One and one-half Miles

The River Trail runs along the Wishon Fork of the Tule River from Moses Gulch to Redwood Crossing, and its mainly a fisherman's trail,

#### Griswold Trail - Four Miles

This trail originates at Shake Camp, leads down into the Tule River Canyon, crosses the Wishon Fork of the Tule River at Moses Gulch, follows the river downstream to Silver Greek, then heads uphill to the east up a dry ridge where it leaves the State Forest and enters the Golden Trout Wilderness area. Eventual destinations include Maggie Lakes and the Little Kern River. Because of the steep, arduous and dry climb, the trail is not used extensively and is maintained infrequently, especially the upper reaches.

### III-B. Recreational Attractions

The extensive groves of old growth giant sequoia trees are a major attractive feature of Mountain Home Demonstration State Forest. Views of the more than 4000 individual old growth specimens have been opened up by the harvesting activity that has taken place in the areas since the late 1800s. No other areas have comparable scenic vistas of old growth veterans. The young growth stands of giant sequoias and other species provide a contrast with which to compare the old growth component.

Because of the early exploitation of the giant sequoias in the Mountain Home area, sites of historical interest abound. These sites include: historical stumps, trees, logs, sawmills, and old resort locations. The State Forest also has many examples of prehistoric rock basins and Indian bedrock mortars which are of archaeological significance.

The two ponds on the State Forest are stocked with trout by the California Department of Fish and Game. These ponds are a major attraction to fishermen of all ages during the summer months. Fishing is also available in Bear Creek and the North Fork of the Middle Fork of the Tule River and its tributaries. Hunting is allowed in season for deer, bear, gray squirrels, quail, and grouse. The forest is open to hunting with the exception of a closed area around Balch Park and Forest headquarters.

Trails leading out of the State Forest to the north and east eventually lead into the Golden Trout Wilderness Area. This increases the popularity of trailhead areas at Shake Camp and Moses Gulch. The Balch Park Pack Station provides pack trips for individuals and groups into the Golden Trout Wilderness and other areas in the Sequoia National Forest (Monument?) and the Sequoia National Park.

Haughton's Cave A major attraction to experienced speleologists in the Mountain Home area is Haughton's Cave, also known as Crystal 67 Cave. The cave is reported to have one of the largest underground chambers in the west. Recent maps show the large underground "Mountain Room" to be 360 feet long and 130 feet wide at its widest point. Total explored depth is 415 feet, making it the fourth deepest in California. The cave is accessible only through an underground stream channel with precipitous drops of up to 65 feet. This makes entrance dangerous for all but the most experienced speleologists. Entry is now allowed through a locked entrance gate by special permit, including an inspection of equipment and a required waiver of liability.

Early studies of the cave showed that commercial opportunities existed for the cave if a new and easier entrance could be found into the "Mountain Room". At present, no such entrance has been identified. Other caves may exist in the limestone areas on the Forest as evidenced by numerous sinkholes and disappearing streams.

111-C. Recreation Management Framework

Because of statutory direction, Mountain Home Demonstration State Forest is committed to placing strong emphasis on recreation as the primary use of the area. Past decisions have been made to construct and maintain recreational facilities in a rustic condition and discourage commercial recreational development on the Forest.

New recreation construction in the past has kept up with or exceeded demand for camping facilities. Major campground expansion up to the present 90 sites was completed in 1976. The emphasis since then has been on maintenance of existing facilities.

Historical demand for overnight camping on the State Forest is shown in Illustration III-C-1. Based on the 1960-2001 camper day figures, a linear regression fitted to the data indicates projected camper day use for the future as follows:

Year   Estimated Camper Days

2005	35,419
2010	38,682
2015	41,944
2020	45,207

These projected figures indicate an annual rate of increase of about 2%. Any estimation of future use is difficult, with diminished accuracy the longer the projection is carried out.

# Actual and Projected Camper Days

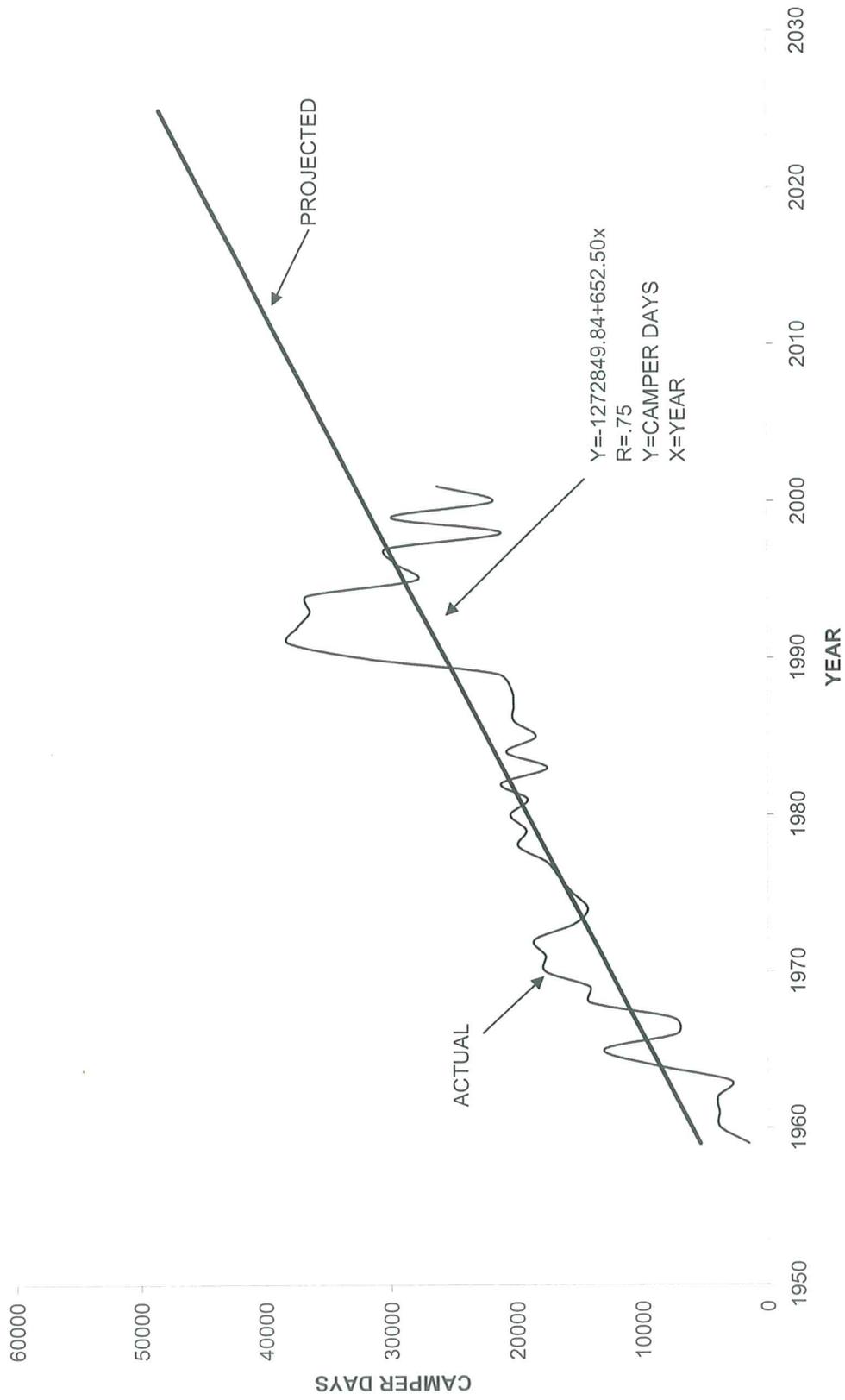


Illustration 3-C-1

### III-C. Recreation Management Framework - continued

The newly established Sequoia National Monument will undoubtedly increase the recreational use on the State Forest. The magnitude of this increase is very much unclear and will depend on the attractions favored by visitors to the Monument. Once the Monument Plan is finalized and approved, a better assessment of potential visitor use can be developed. The event that has dramatically reduced visitor use appears to be the change to year-around school schedules, which resulted in a sharp decline in camping use starting in 1995. This has tended to shift the peak of visitor use toward the second half of the season. Terrorism appears not to have affected camper use on the forest.

At 20,000 - 30,000 camper days per year, the existing recreational facilities can accommodate this level of use. Weekday use is estimated to be around 25 percent of capacity. Campground usage was below the recreational capacity of the State Forest during the second half of the last decade. This pattern of use continues to be the case even without fees being charged for camping. The era of the internet and recreational web sites that promote recreational opportunities on the State Forest will certainly cause an increase in visitors. Unless the visitor use consistently falls within 35,000 - 40,000 camper days per year, additional facilities will most likely not be necessary. At this point a decision must be made to increase facilities or discourage use with various management schemes. Sites for additional campgrounds have been identified and should be considered very carefully.

Some moderation of use may occur as demand reaches or exceeds supply of campground facilities. In the past this has not been a strong influencing factor on visitor use as campground expansion has occurred faster than increase in demand.

Distribution of use throughout the recreation season is also important. Currently visitor use is concentrated between Memorial Day and Labor Day. In the last 25 years, deer season use during the month of October has made a steady decline. This is a result of declining deer populations, reduced interest in hunting, and new hunting regulations restricting hunters to one area of the state in a given season. Further expected decreases in hunting season use, coupled with higher total visitor use will concentrate the camping season into a shorter time frame each year. This will tend to saturate the recreational facilities at a lower total visitor use rate per season.

All recreational facilities are available to the public free of charge. Studies of a possible fee system for our campgrounds have shown the expected revenue of a fee system equaling the cost of collection. Because of the marginal economics, this fee system has not been instituted.

Winter sports use of the forest is currently very low. Winter overnight use is virtually nonexistent. The Forest is occasionally used in winter by cross-country skiers, ice skaters, snow players and off road vehicle enthusiasts. Winter use will remain low unless water sports facilities are developed and roads maintained in winter. The development of winter recreational

opportunities on the State Forest will depend on the Tulare County Road Department and funding from Sacramento. At this time, no planning or funding has been discussed to develop winter recreation opportunities on the State Forest.

Another factor which will influence demand for State Forest recreational facilities is the availability of other recreation opportunities in the area. The only other campground in the immediate area is the County operated Balch Park. Demand for campsites at Balch Park has historically been higher than at State Forest campgrounds. Balch Park has undergone a steady expansion of its facilities and currently has 71 campsites. Additional expansion for Balch Park is not planned for the future. As Balch Park becomes utilized more and more at capacity, State Forest use will increase at a higher rate.

At present, no USDA Forest Service or private campgrounds are in the immediate area. The Forest Service has no immediate plans for recreational development in the State Forest area. The private land poses some uncertainty. The possibility exists for recreational development on private land adjoining the State Forest. Any such development would leave an impact on State Forest use. Private recreation development tends to be more sophisticated and commercialized, including the possibility of cabins, stores, ponds, swimming facilities, etc. This type of development would tend to increase use of the State Forest, especially in the area of day use.

#### III-D. Planning Criteria

1. The State Forest is best suited for a rustic type of recreational facility, since there is likely to be less impact on the other management goals of the forest. This would eliminate from planning such capital improvements as paved campground roads, flush toilets, hookups for electricity and sewer, and commercial concessionaires, with the exception of the pack station. Campgrounds shall be designed for tent campers and small to moderate sized recreational vehicles. Existing design of campground facilities has proven to be vandal resistant, attractive, and economical. These standard designs should continue to be used with experimental use of other designs which show promise of being superior.
2. Recreation areas will not be located in dense old growth giant sequoia groves. These areas are highly hazardous to campers due to the chance of windthrow and loss of limbs from the old growth trees. Also, site disturbance from campgrounds may have an adverse effect on the old growth specimens themselves.
3. First consideration will be made on maintenance of existing facilities. Expansion should occur only if projected operating funds and manpower are adequate to maintain the expanded system.
4. For any new expansion, emphasis will be placed on expansion of existing facilities and concentration of use into moderate sized campgrounds. This will reduce development and maintenance costs. Numerous small facilities scattered over a large area should be discouraged.

5. Major winter sports development is not planned. The major problem discouraging even minor winter sports facilities, such as cross-country ski trails or snowmobile trails, is the lack of road maintenance and parking areas in the winter.

6. Timber management activities must be coordinated with recreation planning. Proposed recreation sites should be harvested in such a way as to remove all current and projected hazardous trees while leaving the young growth stand and understory intact. Small sales will be planned to remove hazardous trees in existing campgrounds as needed. Roads and landings should be laid out with possible recreational use in mind.

7. There are no plans to encourage the use of off-road vehicles on the forest due to the impacts on vegetation and soils. Currently, there are some logging roads that are suitable for 4-wheel drive vehicles, and these are used extensively at the present time. However, cross-country travel and use of these vehicles on hiking trails will continue to be prohibited.

### III-E. Management Guidelines

#### MAINTENANCE

Campground Facilities - Average life of most campground improvements is between 15-20 years. Stoves, bumper logs, handrails, foot bridges, and wooded table tops have the shortest usable life in our current campground design. These items can be expected to be replaced on the average of between 15-20 years of age. Major maintenance, repairs and improvements have been performed at Frasier Mill, Hedrick Pond, Shake Camp, Moses Gulch and Hidden Falls Campgrounds within the last decade. Campground maintenance is a continuous process that varies from year-to-year. The emphasis will be to replace high maintenance structures and re-construct them with more durable materials (i.e. boulders to replace wooden barriers).

Roads - Campground road system will require periodic maintenance depending on use and weather conditions. All roads and parking areas within campgrounds will be surfaced with crushed rock, which will provide for a low maintenance natural appearing, abate dust, and provide an all weather roadbed. At present, 90% of the campground road system is surfaced with crushed rock. The parking areas in some campgrounds need base rock applications and should be surfaced as soon as possible. These roads should then be graded as necessary to maintain the surface and improve drainage.

Water Systems - State and County laws require that public water supplies be treated or be from sealed sources. Since no electricity is available at any of our campground facilities, we must rely upon sealed springs and gravity fed systems to supply water to campgrounds and picnic areas. These systems must be maintained so that contamination will not result from surface water or outside sources. Sampling for bacterial contamination will be performed monthly during the recreation season for all water sources.

Public Corrals - Two sets of public corrals exist in the Shake Camp area. Both sets of these corrals should be maintained for the use of public stock. Both sets of corrals could be expanded to hold more stock. Several small corral paddocks in series is the preferred design to keep stock separated and increase utilization of the corrals. During the expansion phase of these corrals, more durable and maintenance free materials should be utilized.

Pack Station - Leasing of the State owned pack station facility should continue as at present. A lease term of 5-10 years should be encouraged to provide for consistency in the pack station operation. Demand for rented stock by backcountry users is expected to remain at or above present levels.

### NEW DEVELOPMENT

Shake Camp – Room exists at the current Shake Camp location for expansion to a size of approximately 40 sites. This would be an increase of 29 sites over the existing facility. The existing water system could be used until campsite locations higher in elevation than the present tank location are developed. At that time another tank could be constructed above the present tank location. The spring source has an adequate flow to supply an expanded facility.

Enterprise Mill – This site has possibilities for a large 40-50site campground because of its size and gentle topography in the area. Water is available upslope from the proposed location. A suitable site for a group camp exists in the mosquito pond area or the Miller leased property (lease expires in 2015) in T.19S, R.30E, Section 25.

Section 19, East of Tule River – Several small benches and flats in this area are suitable for moderately sized campground development. Vegetation is dense young growth which would give good shielding between campsites. Water is located upslope.

Hidden Falls – This campground area is used heavily for day use. Several picnic sites could be developed immediately east of the river, which could be used for day use only.

Two handicap accessible campsites will be developed. Also, a ramp and fishing pad should be constructed for wheel chair access at Hedrick Pond Campground. The development of these facilities will be dependent on special funding.

SPECIAL PROGRAMS

Campground Hazard Tree Program – The forest currently has a system of hazard tree evaluation in all of the recreational facilities. All trees which pose a potential hazard to any person, vehicle, or improvement within the recreation area are evaluated and mapped. This gives a permanent record of all trees and shows that they have been evaluated for hazard. This system should be maintained and expanded to cover any new construction.

Fee System - Continue to evaluate the possibilities of instituting a fee system for the State Forest campgrounds, if this system can be made cost effective and beneficial to the total recreational program.

111-F Proposed Timetable of Recreational Development and Maintenance

Repair Frasier Mill, Hedrick Pond, Shake Camp, Moses Gulch and Hidden Falls Campgrounds	-----	On-going
Crushed Rock Surface All Campground	-----	2002 - 2015
Expand Shake Camp Campground	-----	2002 - 2015
Hidden Falls Picnic Sites	-----	2002 - 2015
Enterprise Mill Campground	-----	2002 - 2015
Mosquito Pond Group Camp	-----	2002 - 2015
Section 19, East of River	-----	2002 - 2015

IV. EXPERIMENTS AND DEMONSTRATIONS

IV-A Inventory

Completed Experimental Projects

1. *Growth Plots on Mountain Home State Forest, State Forest Note #1, 1960*
2. *Timber Stand Improvement by Poisoning Black Oak on Mountain Home State Forest, State Forest Note #2, 1960.*
3. *Tree Planting and Seeding on Mountain Home State Forest, State Forest Note #18, 1963.*
4. *Artificial Protection of First-Year Natural Seedlings on the Mountain Home State Forest in 1963, State Forest Note #22, 1964.*
5. *Artificial Protection of Natural First-Year White Fir Increases Survival, State Forest Note #32, 1967.*
6. *Growth of Young Sierra Redwood Stands on Mountain Home State Forest, State Forest Note 172, 1978.*
7. *Measuring the Adam Tree, Largest Sierra Redwood on the on the Mountain Home State Forest, State Forest Note #73, 1979.*

8. *Effects of Fertilizer Starter Pellets on Growth and Mortality of Planted Seedlings on Mountain Home Demonstration State Forest*, California Forestry Note #80, 1982.
9. *Performance of 15 and 13 Year Old Hybrid Pines at Two Sites on Mountain Home Demonstration State Forest*, California Forestry Note 181, 1982.
10. *Control of Western Bracken Fern with Asulam Herbicide on Mountain Home Demonstration State Forest*, California Forestry Note #85, 1983.
11. *Sierra Redwood Christmas Trees from Natural Stands*, unpublished report 1954.
12. *Growth of Sierra redwood and white fir trees before and after release as a result of harvesting nearby sawlog trees*, unpublished report 1964 and 1969.
13. *Quantitative study of recreation use in the Mountain Rome area in 1964*, unpublished report 1965.
14. *Chemical control of vegetation*, unpublished report 1967.
15. *Sierra redwood reproduction on the Mountain State, a preliminary survey*, unpublished report 1967.
16. *Mulching planted trees*, unpublished report, 1972.
17. *Tree\_Ring Reconstruction of Giant Sequoia Fire Regimes*, Laboratory of Tree-Ring Research, University of Arizona, 1992
18. *MOUNTAIN HOME STATE FOREST RECREATION NEEDS STUDY: FINAL REPORT*, Community Development by Design, Berkeley, California, 1990
19. *YOUNG-GROWTH SIERRA REDWOOD VOLUME EQUATIONS FOR MOUNTAIN HOME DEMONSTRATION STATE FOREST*, California Forestry Note No. 103, 1991
20. *Excavation at Sunset Point Site (CA-TUL-1052), Mt. Home Demonstration State Forest*, Dillion, 1992
21. *Vegetation Responses Following Three Management Strategies in a Giant Sequoia Forest on Mountain Home Demonstration State Forest*, California Forestry No. 111, 1998
22. *Growth of Young Giant Sequoia Stands on Mountain Home Demonstration State Forest*, California Forestry Note No. 113, 2000
23. *Commercial Thinning to Reduce Forest Fuels*, Mountain Home Demonstration State Forest, California Forestry Note No. 114, 2000
24. *White Pine Blister Rust at Mountain Home Demonstration State Forest: A Case Study of the Epidemic and Prospect for Genetic Control*, USDA, Pacific Southwest Publication (PSW-204),
25. *Preliminary Young-Growth Sierra Redwood Stem Analysis and Heartwood Volume Equations for Mountain Home Demonstration State*

Forest, Technical Report 10, California Polytechnic State University, San Luis Obispo, CA, 2000

26. *SURVEY OF SENSITIVE WILDLIFE ON MOUNTAIN HOME DEMONSTRATION STATE FOREST*, Reginald H. Barrett, U.C. Berkeley, 1996.
27. An Annotated Species List of Terrestrial Vertebrates-Mountain Home Demonstration State Forest, Reginald H. Barrett and David W. Bise, U.C. Berkeley, 1995.
28. Enterprise Mill Historic Site CA-TUL-814H, Mountain Home Demonstration State Forest, David Dulitz, 1998
29. Mountain Home Demonstration State Forest Botanical Survey, William Trayler and Thomas Mallory, California State University, Fresno, 2000.
30. Mountain Home State Forest On North Fork Tule River (Watershed Assessment), Prepared under contract by the U. S. Forest Service, Sequoia National Forest, 2002
31. Forest Carnivore Survey Report, Mountain Home Demonstration State Forest, Fall 2001 and Spring 2002.

#### Ongoing Studies

1. Growth and yield of Young Growth Sierra Redwood. This study continues work published in State Forest Note #72. A second Forestry Note, No. 113, was published in 2000 on the yield of second growth giant sequoia. Future plans call for continued measurement of the existing growth plots and further projections of yield based on cubic foot and board foot volumes.
2. Photo Point Study This ongoing experiment documents changes in the forest landscape over time with a system of permanent photo points.
3. Hybrid Pines Performance of 15-year-old hybrid pines was reported in California Forestry Note #81. This study should be continued to evaluate growth for a longer period of time.
4. Blister Rust Virulent Race Historical information contained in the file that looks at long term trends of the virulent race establishment and spread. Twenty-six potential ontogenetic sugar pine trees have been identified on the State Forest. Seed will be collected and a long-term study to test for slow rusting resistance should be under taken. This would replace the MGR monitoring plantations that were infected with the virulent race of the disease. All trees have been tagged and mapped.
5. Vegetation Responses and Fire Hazard with and without Burning in Uneven Aged Cuts. This study looks at vegetation responses in various sizes of group selection units with three methods of slash treatments, broadcast burning, piling and burning, and lopping. Scott Stevens published an article in Forest Ecology and Management in 1999. A

measurement of these plots should be performed within the next five years.

6. Growth Response of Giant Sequoia After Harvesting - Various data on the release of old-growth giant sequoia after logging.
7. Uneven-Age Management Study - Preliminary study to do a literature review and propose an uneven aged study in timber types of the State Forest - Possible future project.
8. Response to Management Strategies in Young-growth Giant Sequoia Stands at Mountain Home Demonstration State Forest. Contract with California Polytechnic State University, San Luis Obispo, CA. Report due in 2003.

#### IV-B. Management Framework

Past and current policy of the Department has placed a high priority on experimental work on the State Forest. Experimental work has been accomplished by the State Forest staff and also by researchers from outside of the CDF organization. To aid in carrying out experimental projects, revenue from State Forest timber sales is deposited in the Forest Resources Improvement Fund. Money has been made available in recent years from this source to fund outside contracts for research on the State Forests.

Past emphasis on experimental work has been on reforestation, giant sequoia management, and recreation. The forest is unique in that recreation is identified as the primary use and giant sequoia is a major component in the forest. This points out that we should continue experimental work in the areas of recreation and giant sequoia management. An updated assessment based on current technologies should be utilized to evaluate and select future projects in these areas.

Projects dealing with the impacts to sensitive species from various harvesting methods and their habitat requirements should be emphasized. Also of prime importance in the Southern Sierra Nevada are solutions to regeneration problems, both natural and artificial. Experimental work in all aspects of regeneration is still needed.

Another general category of experimental work, which should be considered, is the effect of the California Forest Practice Act on timber harvesting in terms of cost, environmental impacts, mitigations, and productivity.

Because of the general trend towards management of younger stands, experimental work concentrated on young growth management should be considered. Studies concerning optimum growing stock levels, young growth harvesting equipment, reduction of stand damage during intermediate cuttings, and comparisons of even aged and uneven aged management, would be examples.

Various avenues exist for publication of results of experimental work. The main in-house publication is the California Forestry Note. Other appropriate journals and publications include the Journal of Forestry, Western Journal of Applied Forestry, and Tree Planters Notes.

#### IV-C. Management Guidelines

1. All of the ongoing studies listed previously should be carried on to completion. The workload of new experimental projects should not exceed the ability to complete these ongoing studies.
2. Any opportunity to accomplish experimental work by the existing staff should be pursued and projects proposed by colleges and universities should be encouraged. Opportunistic studies, in conjunction with ongoing management activities should continue to be considered.
3. Continue to fund experimental projects to outside researchers from the Forest Resources Improvement Fund. At least one research project a year should be funded for Mountain Home Demonstration State Forest. The Forest staff should continue to provide appropriate topics for consideration by outside researchers as needed.
4. Accomplish prompt reporting of all completed experimental projects. Consider all appropriate journals and publications. Continue publication of a periodic newsletter to report on the State Forest operations including preliminary experimental data and reports not of a nature suitable for California Forestry Notes.
5. Encourage visits and tours of the forest by interested public groups, individuals, schools, and professional organizations.
6. Listed below are proposed future studies in order of priority. These studies would be candidates for in-house study or for contracts with outside researchers.

#### Quantitative and qualitative study of recreation use.

The Recreational Use Study Report prepared in 1990 should be updated when funding is available to stay current on meeting the needs of the public. Outputs would include statistical quantitative information along with perceptions of the public on how our existing facilities serve their needs.

Visitor needs for interpretive programs. Conduct a survey of visitor preferences for show-me trips, nature trails, auto-tours, and campfire programs. Determine level and types of program desired and how conservation messages can best be woven into programs. This will require additional staffing and funding to accomplish.

Hardwood management. Study effects of black oak management at different levels on other species response, sprout growth and regulation, mass production, and growing stock levels.

Campground impact. Determine if soils and vegetation of existing recreational sites are stable or deteriorating. Use points and soil profile measurements. Study the tree growth rates, crown vigor, root development, physical damage, and seed production by species and related to varying degrees of recreational impact.

Optimum stand structure for uneven-aged mixed conifer stands which include a young growth giant sequoia component. Investigate the desirable stocking levels and stand composition of giant sequoia in mixed conifer stands. This data could be useful for landowners throughout the Sierra who are currently planting this species.

Comparative fuel volumes. Conduct a study to compare fuel volumes in the undisturbed old growth giant sequoia type, fuels on recently burned old growth, slash on old cutovers, slash on new cutovers, and different treatments as required by the Forest Practice Act.

Campground rejuvenation. Use different techniques to rehabilitate deteriorating camp areas. Methods might include planting, cultivation, fertilization, and irrigation.

Visitor preference to scenery. Study visitor responses to scenic groves of giant sequoia in a virgin state and those that have been cut to different intensities.

## V. TIMBER MANAGEMENT

### V-A. Volume Inventory

Prior to the purchase of the Mountain Home Tract in 1946, the entire tract was cruised at least twice. The first cruise was performed by the James D. Lacey Company of Portland, Oregon in 1907 or 1908. It is not known what merchantability standards or cull percentages were used in the Lacey cruise.

The tract was partially cruised by the USDA -Forest Service in 1936 and the remainder in 1945 using a 10% sample. Trees 20 inches DBH and larger were measured with a cull percentage of 5% for ponderosa pine, 10% for sugar pine, 20% for white fir, and 30% for incense-cedar.

In 1945, the California Division of Forestry hired a Forest Technician, Belknap C. Goldsmith, to appraise the value of the tract. Goldsmith adjusted the Lacey cruise data for his appraisal. He felt the figures were conservative and would, therefore, yield a conservative estimate of the tract's worth.

According to his notes, the Mountain Home Tract had a total of 92.45 MMBF in whitewoods (young growth giant sequoia was not counted). He arrived at this by subtracting the amount of lumber cut from the tract since the Lacey cruise. The lumber tally figures were supplied by Jack Brattia, a local agent for landowner, Tim Hume. Goldsmith's method of using 37-year-old cruise data and then subtracting the estimated amounts cut with no consideration for growth, gave a very conservative estimate of volume and value to the State Forester, DeWitt (Swede) Nelson. To arrive at the amount of giant sequoia cut since the Lacey cruise, Goldsmith used an actual lumber tally of 17,525 MBF and added 30% for breakage to arrive at a total figure of 25,035 MBF. In his notes he concedes that much of the cut giant sequoia was from dead and down trees, but he was not able to estimate an exact amount. He, therefore, subtracted the entire amount of harvested redwood from Lacey's estimate of standing redwood volume. Although reliance was placed on Goldsmith's data during the purchase of the property and in the early years of management, it is certain that his volume figures were under estimates of the actual stand condition. Listed below is a summary of Goldsmith's volume estimates:

V-A. Volume Inventory - continued

<u>Species</u>	Original Lacey Cruise	Amount Cut (MBF)(MBF)	1945 Stand (MBF)	Utilizable Stand (MBF)	Percent of Stand
P. Pine	11,069	532	10,537	10,537	6.11
Sugar Pine	45,159	5,864	39,285	39,285	22.87
WF & IC	49,788	7,156	42,632	46,632	24.34
	<u>138,358</u>	<u>25,035</u>	<u>113,324</u>	<u>79,326</u>	<u>46.18</u>
Sequoia					
Total	244,364	38,586	205,778	171,780	100.00

Other partial cruises by the State were made after the purchase of the tract. The most notable of these was made in 1955. In 1955, only the most accessible portions of the forest were cruised so this data cannot be compared directly to the earlier cruises.

In 1970 a continuous forest inventory (CFI) system was established and the first measurements taken. The first cutting cycle was expected to be completed before 1980, and more accurate information about growth and inventory was needed to plan the second cutting cycle. One hundred and seventeen permanent plot centers were established by drawing a 20 chain by 20 chain grid over the forest. The intersection points were designated plot centers which were then located on the ground. Since the same plot centers would be used in the future re-measurements, the information would be consistent and accurate. The CFI plots are variable in size. Whether a tree is in or out of the plot is a function of its size and the distance from the plot center. A basal area factor (BAF) of 40 is used for the old growth\_giant sequoia, and a BAF of 20 for all other species. "In" trees are tagged facing plot center at the point of diameter measurement. The plot system is re-measured every five years and the information is used to develop stand and stock tables, determine mortality, basal area, volume, gross and net growth by DBH class and by species.

Total net merchantable volume for the forest (excluding old growth\_giant sequoia) for the last three CFI measurement years is shown below:

Measurement Year	Total Inventory Net Board Feet
1990	149,134 MBF
1995	143,938 MBF
2000	148,536 MBF

V-A. Volume Inventory - continued

Total growing stock levels on the forest have remained fairly constant since acquisition, despite the removal of 103.310 MMBF from 1946 to 2001. This can be seen by comparing the early Lacey, Goldsmith, and Forest Service data with the CFI information as shown below:

	P. Pine (MMBF)	S. Pine (MMBF)	WF & IC (MMBF)	*Total Whitewoods (MMBF)
Lacey (1908)	11.07	45.15	49.79	106.01
Goldsmith's Adjusted Lacey (1945)	10.54	39.28	42.63	92.45
USFS (1936 & 1945)	12.74	40.71	51.66	105.11
CFI (2000)	17.97	20.50	93.56	132.03

\* Does not include redwood or hardwoods

Stand and stock tables for the 2000 CFI data are shown in Illustration V-A-1 and Illustration V-A-2 respectively. Total of trees per acre by DBH class is shown in Illustration V-A-3. Volume per acre by species is shown in Illustration V-A-4. White fir and incense-cedar predominates over pine in the lower diameter classes. In the future, white fir and incense-cedar will have an increasing share of the total forest volume, while sugar pine continues to decrease in both numbers and volume. This trend will be hastened by the current high mortality of sugar pine in the small DBH classes due to blister rust.

Basal area per acre for all species except old growth giant sequoia averages 151 square feet per acre. Basal area per acre by species is shown in Illustration V-A-5. White fir represents 43 % of the total, sugar pine 13%, Incense cedar 20 %, young growth giant sequoia 12 %, miscellaneous hardwoods 8 %, and ponderosa pine 4%. Old growth giant sequoia, not included in the above percentages, adds an additional 63.7 square feet per acre of basal area.

Management Framework

V-B. Timber Site Quality

Timber site on the forest is, in general, very high. Ninety-one percent of the State Forest is classified as Dunnings Site II or better. Percentage of the total forest area by site class is shown in Illustration V-B-1.

### Stand Table (Average Stems per Acre)

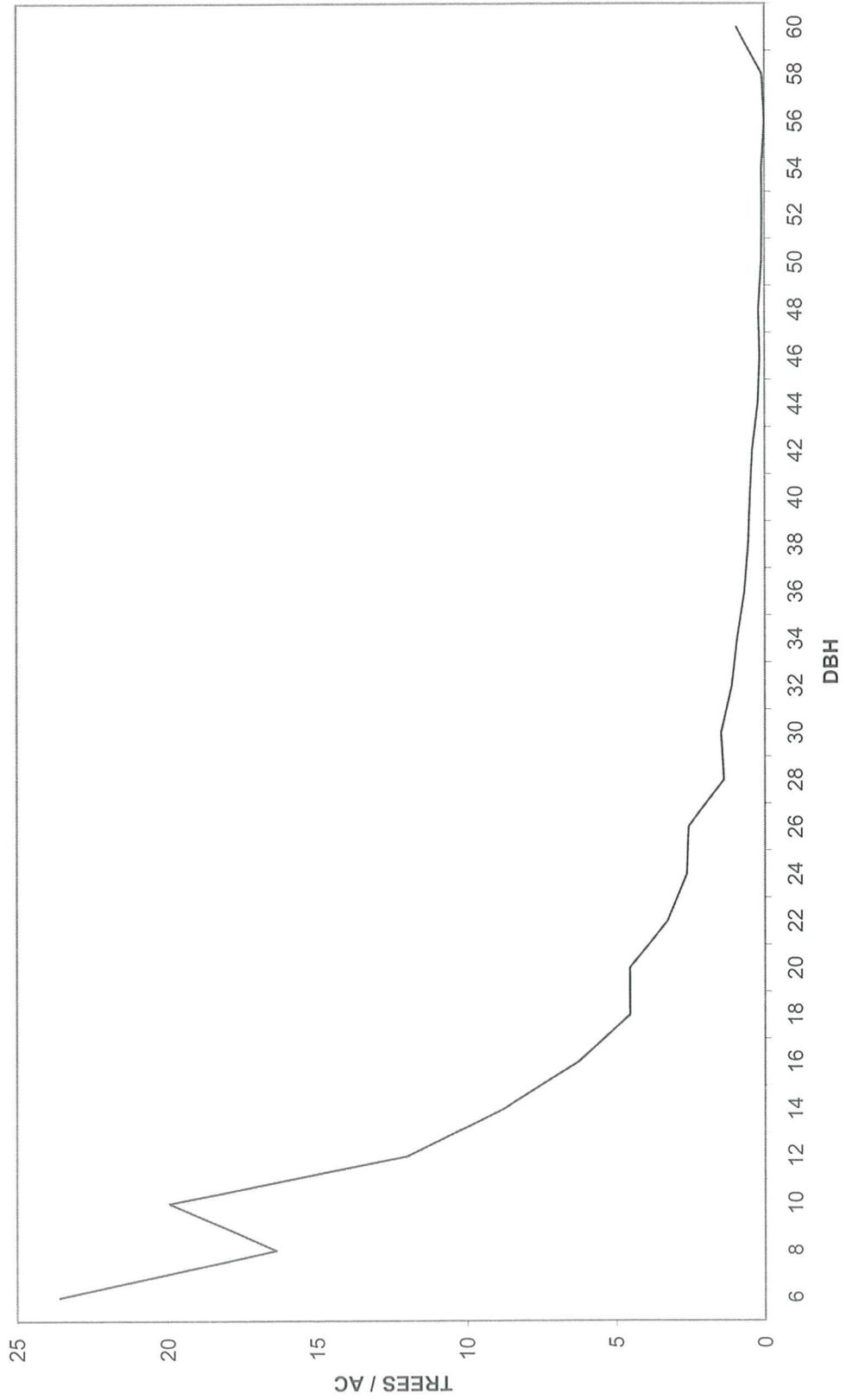
DBH	Ponderosa Pine	Sugar Pine	White Fir	Incense Cedar	Yound Redwood	Black Oak	Live Oak	Old Redwood	Total
0									
2									
4			1.13	1.09					2.22
6	2.47	0.85	9.43	7.27		2.22	0.75		22.99
8	2.30		8.49	1.95	1.55	2.08			16.37
10	0.83	1.48	7.98	6.25		3.40			19.94
12	0.20	0.99	4.31	3.15	1.17	2.38			8.80
14	0.30	0.59	4.24	1.60	0.43	1.32		0.32	8.80
16		0.45	2.39	2.04	0.58	0.57		0.25	6.28
18	0.18	0.53	2.47	0.82	0.18	0.36			4.54
20	0.15	0.43	2.35	0.72	0.52	0.29	0.07		4.53
22	0.19	0.18	1.46	1.03	0.25	0.12	0.06		3.29
24	0.15	0.10	1.45	0.41	0.26	0.26			2.63
26	0.09	0.26	1.29	0.45	0.35	0.13			2.57
28		0.23	0.68	0.30	0.15	0.04			1.40
30	0.10	0.30	0.83	0.06	0.13	0.07			1.49
32	0.03	0.23	0.52	0.14	0.15	0.06			1.13
34	0.08	0.15	0.36	0.23	0.08	0.05			0.95
36	0.02	0.11	0.32	0.14	0.09				0.68
38	0.02	0.06	0.27	0.08	0.11	0.02			0.56
40	0.02	0.13	0.19	0.07	0.07	0.02			0.50
42		0.04	0.15	0.05	0.15			0.03	0.42
44		0.09	0.02	0.08	0.03	0.02			0.24
46	0.03	0.03	0.04	0.03	0.04				0.17
48		0.09	0.03	0.01	0.05			0.03	0.21
50		0.02	0.02	0.04	0.02				0.10
52		0.02	0.01		0.02		0.01	0.02	0.08
54		0.06	0.01		0.03				0.10
56		0.01							0.01
58		0.03	0.01	0.02	0.02			0.02	0.10
60	0.01	0.03	0.01	0.03	0.09			0.78	0.95
<b>Total</b>	<b>7.17</b>	<b>7.49</b>	<b>50.46</b>	<b>28.06</b>	<b>6.52</b>	<b>13.41</b>	<b>0.89</b>	<b>1.45</b>	<b>115.45</b>

## Stock Table

(Average Net Merchantable Board Foot Volume per Acre)

DBH	Ponderosa Pine	Sugar Pine	White Fir	Incense Cedar	Young Redwood	Total
0						
2						
4			22.7	3.4		26.1
6	95.2	4.2	323.1	40.0		462.5
8	350.7		527.1	26.0	49.2	953.0
10	282.9	38.1	841.6	131.9		1294.5
12	96.4	50.7	745.5	114.1	93.6	1100.3
14	197.0	48.8	1053.2	91.9	52.2	1443.1
16		57.1	800.5	163.1	75.0	1095.7
18	203.8	98.5	1069.9	96.7	41.2	1510.1
20	206.5	112.3	1368.7	122.1	152.9	1962.5
22	210.4	62.7	1063.2	229.7	93.1	1659.1
24	318.7	46.2	1242.0	119.6	123.9	1850.4
26	214.4	152.8	1280.2	162.3	211.0	2020.7
28		166.7	867.0	142.0	111.4	1287.1
30	327.6	266.7	1218.2	39.5	116.0	1968.0
32	110.3	256.9	897.1	85.8	150.6	1500.7
34	329.7	212.8	719.1	189.1	94.8	1545.5
36	112.5	191.7	685.2	141.7	131.0	1262.1
38	112.7	122.1	636.1	61.1	169.6	1101.6
40	113.7	305.0	527.2	104.7	142.5	1193.1
42		90.0	414.1	73.8	329.0	906.9
44		242.5	54.4	133.6	69.3	499.8
46	231.9	103.7	163.3	56.9	115.0	670.8
48		379.8	108.7	34.8	160.8	684.1
50		116.3	106.2	72.2	83.0	377.7
52		122.0	43.0		84.8	249.8
54		353.2	40.2		131.2	524.6
56		64.9				64.9
58		200.4	15.8	26.8	92.0	335.0
60	223.4	399.1	12.9	153.4	635.8	1424.6
<b>Total</b>	<b>3737.8</b>	<b>4265.2</b>	<b>16846.2</b>	<b>2616.2</b>	<b>3508.9</b>	<b>30974.3</b>

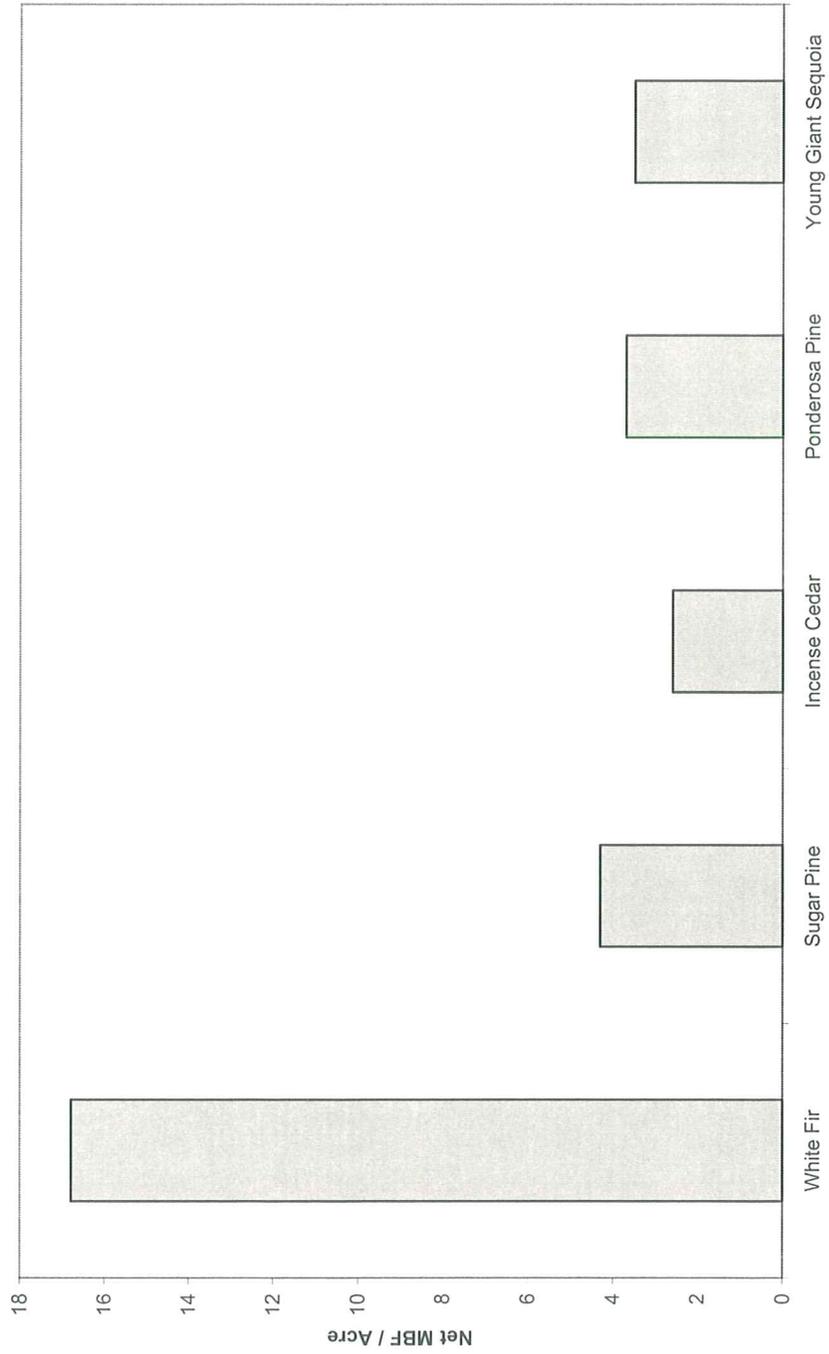
TOTAL NUMBER OF TREES PER ACRE BY DBH CLASS



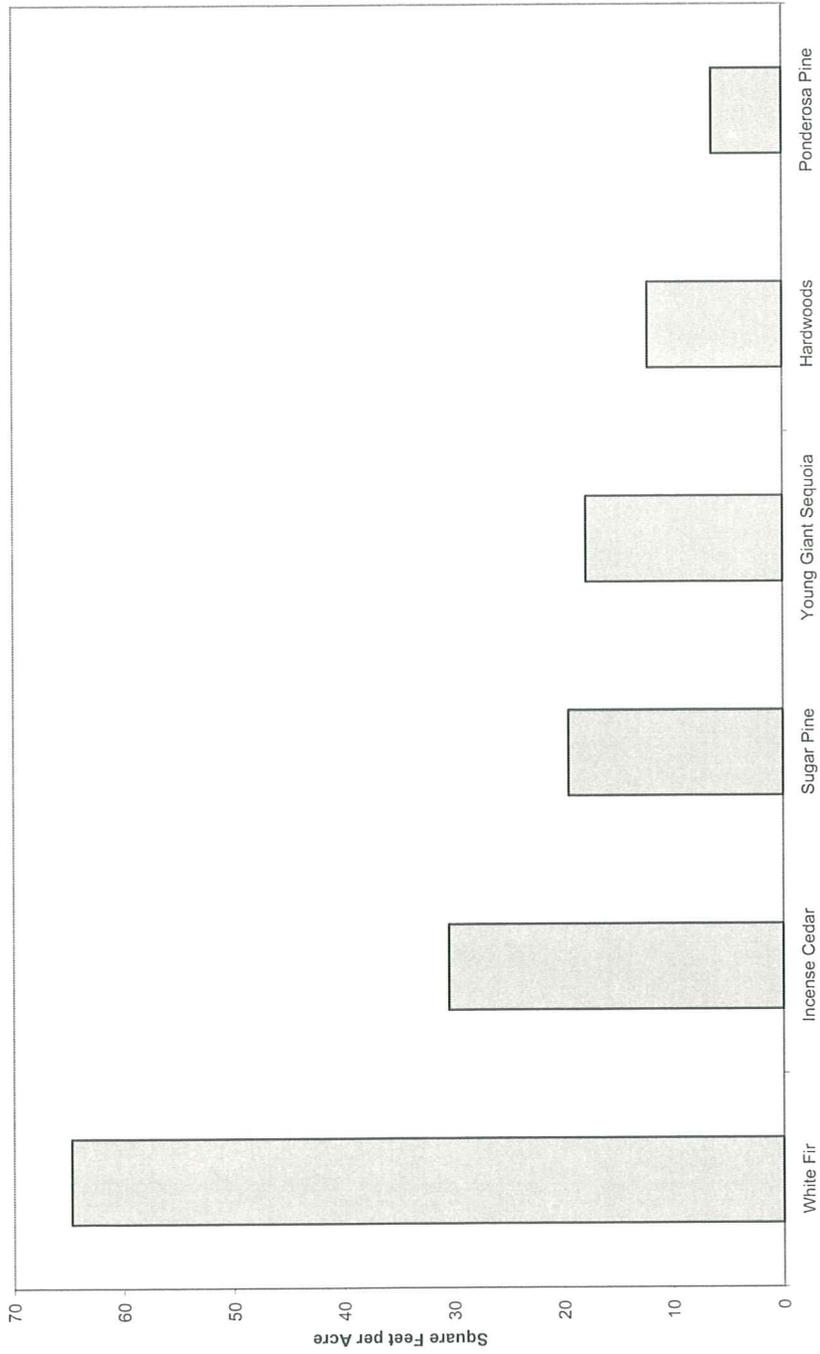
V-A-3

V-A-4

VOLUME PER ACRE BY SPECIES (MBF / ACRE)

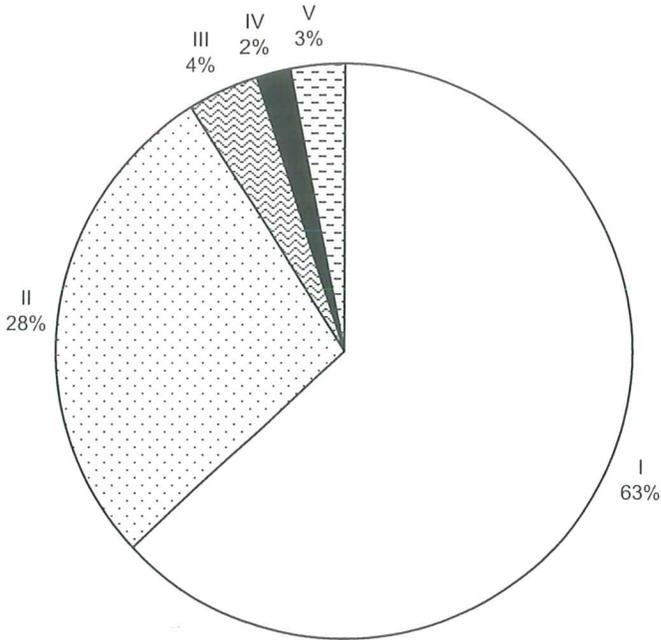


BASAL AREA PER ACRE BY SPECIES



V-A-5

SITE CLASS BY PERCENT



V-B-I

#### V-C. Growth and Yield

In 1952 and 1953, ten one-acre plots were established on the forest. These plots were to help determine tree mortality caused by insects and disease and collect tree growth data for the forest with reference to recent cut-over areas. Entomologist Ralph Ball and Forest Technician Dan Dotta established procedures for the system.

Nine plots were set up in mixed conifer stands and one plot was placed in a second growth redwood stand logged around 1885. The characteristics of the plots varied to represent the different conditions on the forest.

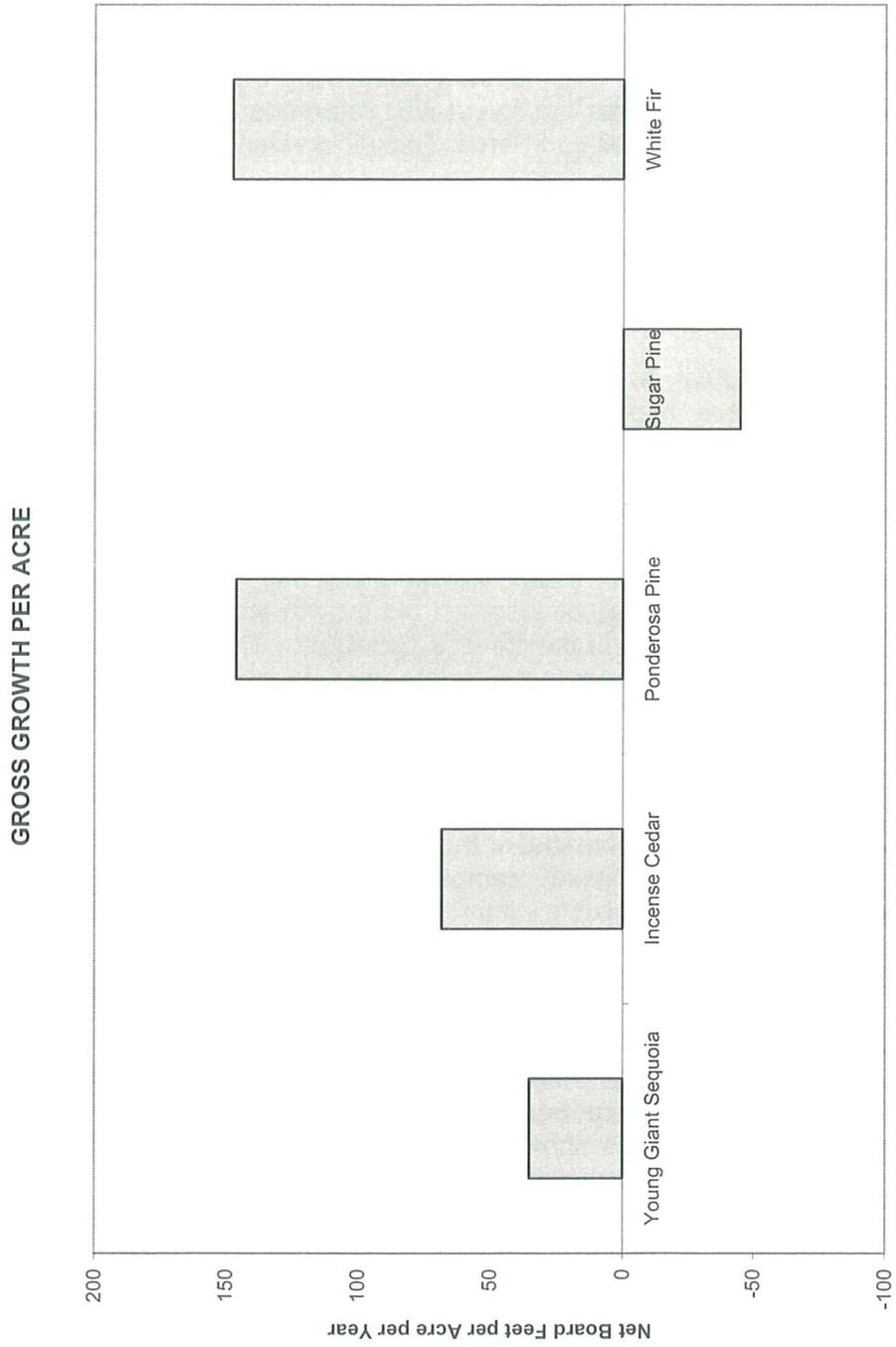
All plots were rectangular, two chains by five chains. All trees 11.6 inches in DBH or greater were measured, numbered, and tagged at the point measured. Pole-sized trees were counted and the reproduction sampled in addition to the growth and mortality data gathered. Plots were measured every five years.

Prior to the establishment of these growth plots, net growth had been considered to be zero because of stagnant old growth stands. The growth plots provided local evidence of the forest's capability. The periodic annual increment ranged from 385 board feet per acre per year to 786 board feet per acre per year during measurement of these growth plots from 1959 to 1976.

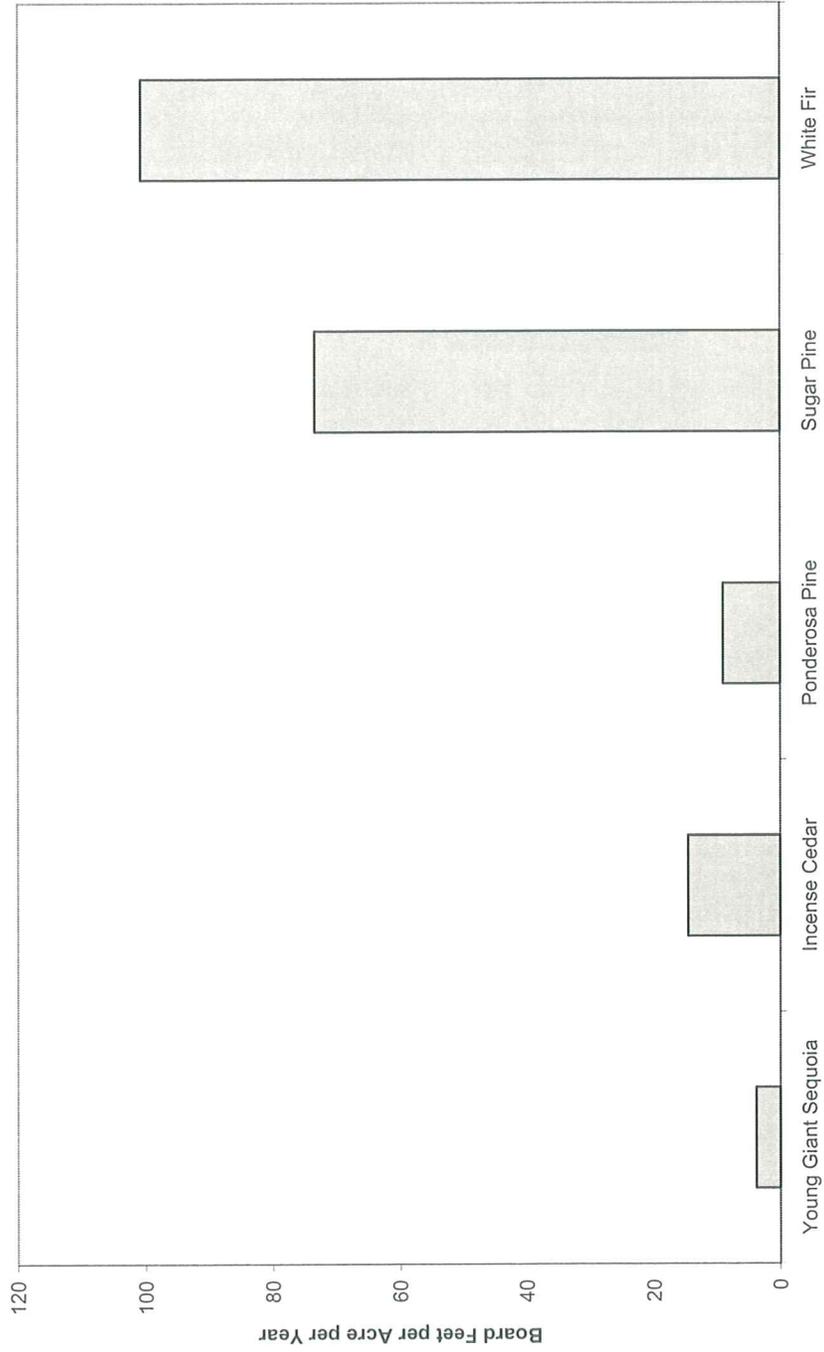
The simplicity of the early growth plot system was both a strength and weakness. It was relatively easy to gather information quickly for future timber sales and the growth potential of the forest once the outgrowth timber had been removed. The small sample size made large fluctuations inevitable. Logging or road building within a plot had a disproportionate effect on the overall growth information.

CFI growth information has been obtained for the periods of 1990-1995 and 1995 - 2000. Gross growth (survivor growth plus in-growth) for the 1995 – 2000 period has averaged 554.3 board feet per acre per year. Total forest growth is 2,664 MBF per year based on 4807 productive acres. Gross growth per acre by species is shown in illustration V-C-1. Net board feet mortality for the 1995 – 2000 period has averaged 202 board feet per acre per year. Illustration V-C-2 shows mortality by species. Sugar pine and white fir exhibited a disproportionately high share of the forest-wide mortality. Net growth (gross growth minus mortality) averages 353 board feet per acre per year. Net growth by species is shown in Illustration V-C-3.

V-C-1

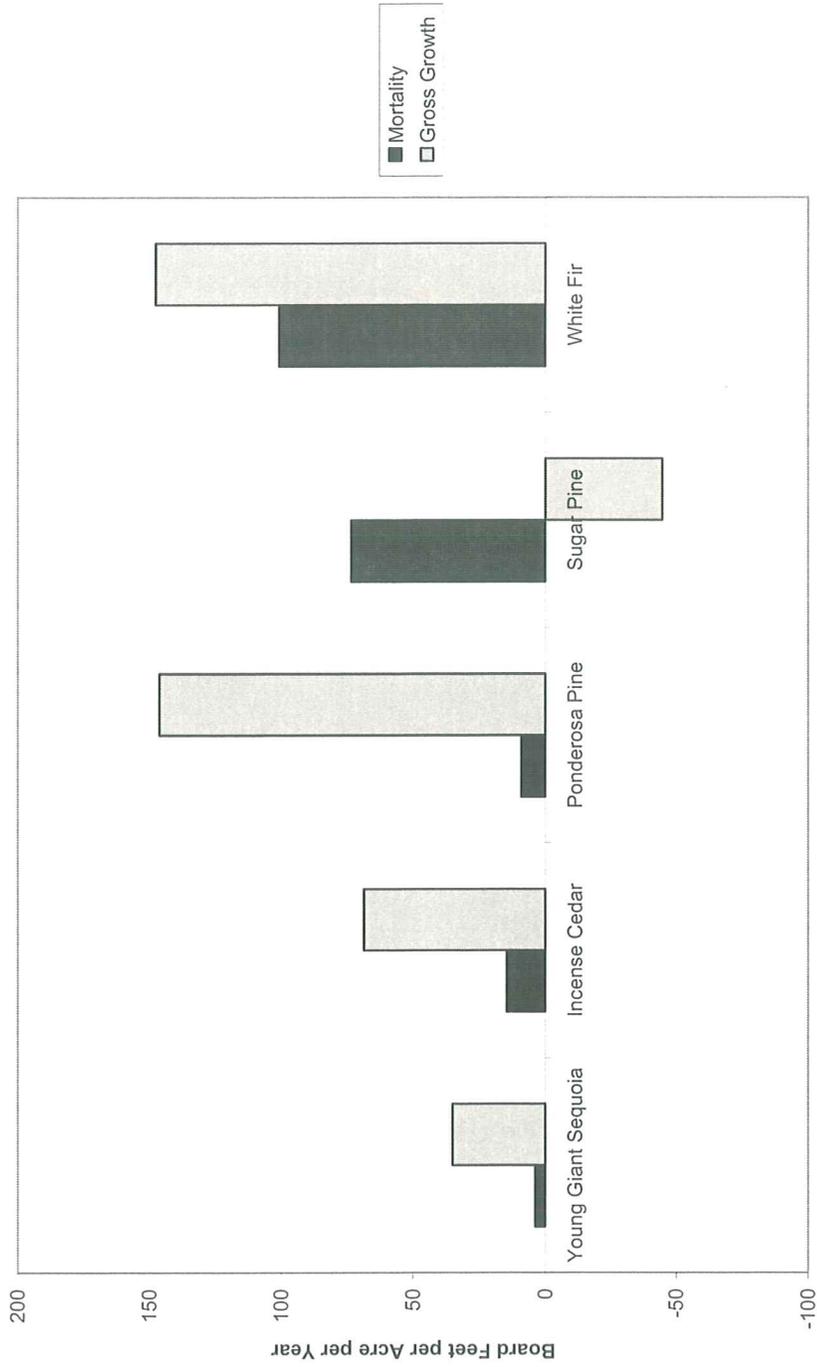


MORTALITY BY SPECIES



V-C-2

NET GROWTH BY SPECIES



V-C-3

V-D. Rotation Ages

Board policy directs that State Forest timber will be harvested on the basis of maximizing the mean annual increment (MAI) of high quality forest products. Optimum rotation ages should occur where the MAI culminates for the units being harvested, in our case, board feet. Listed below are rotation ages by site as indicated in three commonly used yield tables for the Sierra Nevada region.

	Mixed Conifer Dunning & Reineke <u>1933</u>	White Fir Schumacher <u>1926</u>	Ponderosa Pine Mayer <u>1938</u>
Site I & A	110 Years	80 Years	75 Years
Site II	130 Years	90 Years	90 Years
Site III	140 Years	100 Years	110 Years
Site IV	150 Years	100 Years	150 Years

These rotation ages are based on culmination of MAI expressed in International 1/8 board foot measure. Rotation ages would be slightly longer if volume was expressed in Scribner board feet.

V-E. Silvicultural Systems

No single silvicultural system can be applied to the entire State Forest area because of the diverse nature of the existing timber stands. In fact, stand differences within given sale areas necessitate different silvicultural treatments in close proximity to each other. Silvicultural prescriptions must be flexible enough to be tailored to different stand conditions as required.

Uneven-aged management is the primary silvicultural system used on the State Forest. This system is most compatible with the high recreational use of the forest because it results in an aesthetically pleasing leave stand following logging. It is also desirable on sites where artificial regeneration is difficult. Natural regeneration will be the most important regeneration method with this system with some supplemental tree planting. The system can be used effectively where the current stands are of mixed species and age. This occurs on approximately 75% of the State Forest land base.

Up to the present time, the cutting cycle has been long, approximately 30 years. This cutting cycle will need to be adjusted as stand structure change due to harvesting, mortality, vigor, and fuels reduction projects. The goal is to maintain a healthy vigorous forest, that is esthetically pleasing with a diverse assemblage of stand structures.

The cutting cycle may eventually need to be reduced to 20-25 years. This practice would tend toward larger sale areas and lower mortality by more frequent removal of high-risk trees. The cutting cycle is, and will continue to be, long in comparison with traditional silvicultural methods. Long cutting cycles have the advantage of less frequent site disturbance, more time for site

recovery, concentration of visual impacts to smaller area, and more manageable sale areas.

Even-aged management is being used on the forest where the existing stands occur with little or no understory of younger age classes. The resulting small clearcuts following harvesting have been limited to small areas of 10 acres or less, generally under 2 acres. Artificial regeneration has been used in these areas and has resulted in young plantations of mostly ponderosa and Jeffrey pine scattered throughout the forest. Older seed tree cuts have resulted in young stands of mixed species. Well-stocked plantations with tree spacings of 8x8 to 10x10 feet are in need of pre-commercial thinning at age 15-25 years. One or more commercial thinnings can be anticipated in these stands at approximately age 40 until rotation age.

#### V-F. Logging Systems

The exclusive logging system used on the State Forest until 1991 had been tractor logging using conventional ground skidding equipment. In 1991, helicopter logging was used to salvage the insect killed timber that was being exacerbated by the long-term drought. Since then, helicopters and ground based equipment have been used for green and salvage logging operations. Some areas of the forest are well suited for a short span skyline system.

There are also a few areas which were tractor logged in the past which should be cable logged in future cutting cycles to avoid continued environmental damage. Several such cutting units exist on the eastern aspects in the Wishon Fork of the Tule River drainage. In future timber sale planning, some road relocation may be needed in these areas to accommodate cable-logging systems.

#### V-G. Allowable Cut

In the 1958 management plan for the forest, it was estimated that the land base was capable of growing 300 board feet per acre per year. This equates to a total forest growth of 1.37 MMBF per year. The allowable cut level was set

at 2-3 MMBF per year for the first cutting cycle to remove the large volume of old growth present on the forest at the time of State acquisition. It was believed that after the end of the first cutting cycle the old growth would be removed and the allowable cut reduced to 1.37 MMBF on a sustained basis. The actual annual cut for the period 1946-1973 averaged 2.20 MMBF per year and by the end of the first cutting cycle in the early 1970's, a large amount of old growth timber still remained. During this period the growing stock level of the forest has remained constant.

Current CFI information indicates an allowable cut of 1.69 MMBF per year based on a net growth of 353 board feet per acre per year on 4807 productive acres. At the present time, the old growth component is not contributing to the total forest growth in a positive way. The gross growth of the old growth timber is being offset by the high mortality in the large DBH classes. The allowable cut for the remainder of the second cutting cycle may

need to be adjusted slightly to a higher level than current net growth to allow for high levels of insect killed timber, fuels reduction treatments, and maintenance of a healthy vigorous forest. The allowable cut for the next decade, based on 2000 CFI data, will be approximately 16.9 MMBF. This figure may need to be adjusted after the next CFI measurement is completed in 2005.

#### V-H. Timber Markets

The uncertain supply of logs, increased regulation, and dedication of timberlands to other uses has significantly reduced the number of available mills within the area of influence of the State Forest. Currently, Sierra Forest Products has the only major sawmill in Tulare County. It is located in Terra Bella, 46 miles distant, with an average production of about 62 MMBF per year. All other large mills in the surrounding counties are no longer in operation. One small sawmill is in the local area which provides a market for salvage timber.

#### V-I. Management Guidelines

1. Ground skidding equipment should, in general, be limited to slopes less than 40%. Cables systems will be appropriate on slopes steeper than 50% or in some sensitive areas such as watercourse protection zones.
2. An allowable cut of between 3.38 MMBF every other year appears to be indicated by the CFI. Adjustments may be required in the future to maintain a healthy and vigorous forest. The goal is to base the harvest on the indicated net growth of the forest on a sustained yield basis.
3. Continue to utilize uneven-aged management as the primary silviculture system in future cutting on the State Forest. Artificially regenerate openings caused by the removal of trees in group selection. Rely on natural regeneration in other areas.
4. Rotation ages will be set where MAI culminates. Rotation ages will vary from 75 to 150 years depending on species and site.
5. The cutting cycle will remain at approximately 30 years, and may need to be adjusted in the future to 20-25 years.

#### V-J. Minor Forest Products

##### Dead and Down Redwood

The forest contains a considerable amount of dead and down old growth giant sequoia. This material consists of various size and type of material, varying from small chunks and waste from 100 year old logging operations to recent windthrown trees of various ages. Some of the down material includes logs of special scenic, historical, and recreational value. Because of the remarkable decay resistance of the giant sequoia heartwood, some of the material may be over 500 years old since falling and still be of merchantable value. This older

material will begin to show some advanced decay, especially where it has been partially buried. From 1974 through 1978, a 100% cruise of this dead and down material was made. Size, type and condition of the material was recorded and volumes were calculated in cubic feet. The logs were numbered and plotted on maps. The information is updated periodically to delete material harvested or add newly windthrown trees.

The inventory of dead and down material increases with time as trees are lost to natural causes. Since State acquisition, usually 1-2 trees per year have been lost due to windthrow. This coincides closely with a theoretical loss figure of 1.42 trees per year based on an estimated 4000 living old growth giant sequoia on the forest with a life span of over 3000 years.

Dead and down giant sequoia has been sold on a small sales basis since 1946. Total volume removed from 1946-2001 has been 5,165 MBF. Giant sequoia for CDF use has also been removed since the early years of the forest. Total CDF use of giant sequoia 1946-2001 is 1,838 MBF for an average of 33 MBF per year.

Starting in 1978, demand for redwood from private operators increased dramatically. It was soon realized that if unlimited small sales were made, demand would soon outstrip supply. In 1981 a volume limit of 10 MBF per individual per year for dead and down redwood was placed in effect. In recent years, the volume has been reduced to 2 MBF per licensed timber operator.

The first priority for giant sequoia sawlogs should be for Department use. This material can be utilized by the Mountain Home Conservation Camp and sawn into lumber suitable for sign stock, picnic tables, fence posts, etc. This will supply the needs of the recreational development and maintenance on the forest and for other CDF uses. All down giant sequoia which has a historical, scenic, or research value should be protected.

#### Fuelwood

Demand for fuelwood from the State Forest made a steady decrease this past decade. Fuelwood permits have remained constant with 20-25 permits issued per year. Fuelwood cutting has been limited in recent years to dead and down wood only. At the current level of cutting, the supply of wood exceeds demand. Allowing fuelwood cutting on the forest is desirable to reduce the fire hazard along roads and to assist in the clean up of timber sale areas. We should continue to encourage the removal of dead and down fuelwood on a commercial or personal use basis utilizing the Class I timber sale permit.

#### Salvage

Prompt removal of salvage sawlogs is important in realizing some value from recently killed or damaged timber. Standing dead timber left for more than one year in the woods seriously degrades in value. Efforts should be made to sell as much of this timber as quickly as possible. State policy allows for the removal of 100 MBF or \$25,000.00 worth of timber on a small sales basis

without bids. This is the most expeditious way to remove salvage volume quickly and should be used as much as possible.

#### Miscellaneous Forest Products

Incidental sales of miscellaneous forest products will be made as conditions warrant and time and markets permit.

#### V-K. Giant Sequoia Management

##### Grove Boundaries

Giant sequoia occurs in distinct groves throughout its range. Numerous names have been assigned to the groves within the Forest. The Mountain Home Grove is universally used to describe the central grove area on the Forest. The western fringes of the Mountain Home Grove have been sometimes called the Rancheria Grove. The southern fringes of the Mountain Home Grove have been referred to as the Crystal Springs Grove. The grove along the Wishon Fork of the Tule River has been called the Middle Fork Grove. For the purposes of this document, all of the above mentioned grove areas will be called the Mountain Home Grove. A separate grove exists in the Silver Creek drainage and that grove will be referred to as the Silver Creek Grove. This convention agrees with that used by Willard in his 1994 publication *Giant Sequoia Groves of the Sierra Nevada*.

##### Definition of old growth/young growth

A definition for individual old growth and young growth giant sequoia trees was developed during the initial years of the continuous forest inventory system. The definition is based on physical tree characteristics that are indicators of age and not on specific tree diameter. Diameter growth is highly variable depending on various tree and stand factors and not an absolute indicator of age. Age is also difficult and time consuming to determine on large standing trees.

Height growth is not as variable in individual trees as diameter growth and is one of the factors used in the definition. Maximum height growth on giant sequoia is approximately 240 feet on sites within the State Forest. As this maximum height growth is reached the tree crown loses its pointed top and becomes more rounded in appearance. This starts to occur at an approximate age of 200 years.

Limb characteristics are another very good indicator of age. Giant sequoia trees tend to retain the lower branches on the bole longer than most other species. Limbs can also obtain a very large size. Young growth trees typically have limbs on the lower 1/3 of the bole. Old growth trees will have the lower boles clear of limbs except for an occasional large limb or burl.

The following chart lists various tree characteristics to be used in determining whether a giant sequoia tree is young growth or old growth.

## Young-Growth

Branches (alive or dead) or knot indicators in the lower 1/3 of the bole.

Branches small, generally less than 4 inches in diameter.

Pointed crown, height growth rapid. Top of crown rounded.

Growth rings large, averaging 1/10 inch or wider.

DBH generally less than 80 inches.

No evidence of fire scars. Many trees with fire scars.

Excessive taper in open grown trees. Very little taper in bole.

Shallow bark furrows. Deep bark furrows.

Total height is generally less than 200 feet.

## Old-Growth

Lower 1/3 of bole relatively free of branches or knot indicators.

Large branches, many larger than 4 inches in diameter.

Narrow growth rings, less than 1/10 inch or wider.

DBH generally greater than 60 inches.

Height is often over 200 feet

## Old Growth Inventory

Giant sequoia is present on approximately 2,677 acres of the total forest area, with an estimated 4,000 old growth trees, for an average of 1.5 trees per acre. The CFI indicates that there is about 63.7 square feet of basal area per acre of old growth.

In 2001, the state forest staff began inventorying and mapping all the old growth giant sequoias on the MHDSF. So far, well over 1,000 old growth trees have been measured and located using Global Positioning System (GPS). Stand and stock tables will be developed to assist in the management of the giant sequoia component on the state forest. In addition, a stump inventory of all the giant sequoias that were cut during the historical logging periods has been completed. These two inventories, along with research and demonstrational projects will assist the staff to manage the giant sequoia stands on the state forest.

### Young Growth Inventory

The 2000 inventory of young growth giant sequoia based on the Continuous Forest Inventory plots shows a total of 31,390 trees. There is an average of 6.53 young growth trees per acre. There is a total net volume of 16,867 MBF of young growth sequoia within the state forest.

Some planting of giant sequoia has occurred outside of the giant sequoia grove boundary. These young trees have yet to reach a size to be included in the inventory or have been missed by the inventory plots.

### Management Guidelines

Standing old growth giant sequoia trees will not be harvested and shall be protected from damage from all management activities. Young growth giant sequoia shall be managed as a timber resource primarily as replacements for old growth trees lost to historical logging (pre 1946) or natural death. The young growth giant sequoia trees will be commercially thinned where their density is too great for all trees to grow into old growth replacements. Pre-1860 estimates of old growth giant sequoia densities and distribution shall be used to determine the desired stand structure of old growth giant sequoia.

It is recognized that the lack of disturbances in the groves will result in very little giant sequoia reproduction. Disturbance in the form of fire or timber harvesting is needed to encourage giant sequoia reproduction. Timber harvesting will remain the primary disturbance in the state forest to encourage giant sequoia reproduction. Prescribed fire will be used in certain situations to reduce fuel loadings, provide for a mineral soil seedbed and provide heat to open giant sequoia cones.

Careful timber sale planning, strict contract provisions and diligent sale administration will prevent adverse effects to the old growth trees during harvesting activities. Care must be taken to avoid any cutting or removal of the shallow root system when constructing roads, skid trails, and landings. Timber falling must be done carefully so that top and bole damage does not occur by felling timber into old growth trees.

Selective harvesting of white fir, pine, and cedar within the groves will improve vistas of individual old growth giant sequoia. This harvesting can be effectively used to enhance the aesthetic resources of the forest for recreational visitors.

No timber harvesting will occur in the Silver Creek grove.

Giant sequoia planted outside of the natural grove area will be managed as a timber resource. No attempt will be made to expand the grove area by allowing these planted giant sequoia trees to become old growth.

## VI. EDUCATION

### VI-A. Inventory

At present, the State Forest is involved in education at a modest level. Tours and programs are provided for various groups of people each year. These groups have included college students, environmental education instructors, resource managers, and other general public groups.

The forestry information trail, which starts at Balch Park, is used by a large number of people each year. This self-guiding trail has a trail booklet, which describes the natural history and management of the area.

Educational materials are posted on bulletin boards which exist at the entrance of most campgrounds. The information on these boards emphasizes the campground rules along with any specific concerns such as fire danger or bear problems.

### VI-B. Management Framework

The State Forest is utilized by approximately 40,000 – 60,000 visitors each year. This includes both overnight and day use. This group of people represents the target for education on the forest. In addition, some specific target groups, such as lawmakers or school teachers could be drawn to the forest with special programs.

There are three main educational focuses on the forest. First is an explanation of the rules governing behavior of the visitor while on the forest. This would include such things as hunting regulations, camping and fire rules, off-road vehicle use, etc. The second category would be site specific environmental information about the forest, including natural history, archaeology, and historical background. The third educational focus would include broad conservation messages such as the explanation of the basic concepts of silviculture or multiple use management.

In order to reach as many people as possible with these messages, a variety of interpretive opportunities have been developed. Since staffing on the forest is limited, most interpretive facilities are self-guided or self-explanatory. Self-guided trails and tours, outdoor displays, free handout material, and bulletin display boards are appropriate interpretive mediums. All facilities are vandal resistant and maintenance free as possible.

### VI-C. Management Guidelines

Visitor Center - A visitor center has been incorporated into the headquarters' facility. In addition, an outdoor kiosk has also been added. This provides visitors with interpretive information including handouts, maps, fire prevention information and a place to have any basic questions answered. A separate outdoor interpretive center was also constructed at Balch Park. This serves as a major gathering place for State Forest and Balch Park visitors.

Self-guided Motor Tour - A self-guided motor tour has been developed on existing State Forest and County roads using road junctions and landmarks as cues to descriptive information in a handout. Other stops will be added to increase visitor education and enjoyment.

Interpretive Trails - In addition to the self-guided forestry information trail, the possibility exists for other interpretive trails to be established near existing campgrounds and other heavily used areas. Possible locations of trails include Shake Camp (improve loop trail), Frasier Mill, and the River Trail (Hidden Falls to Moses Gulch). Descriptive handouts placed at the start of these trails would increase the education and enjoyment of the public using the forest while at the same time explaining the management of the State Forest.

Guided Tours - Tours led by a member of the forest staff could be organized and led through different areas of the forest, including historical areas, recent or active timber sale areas, experimental plots, etc. The general public could be notified of tour dates and times through posting in campgrounds and in news releases. Groups should be encouraged to participate in guided tours on a prearranged basis. The addition of the education/research forester position will greatly enhance the ability to provide guided tours on a consistent basis. Development of an environmental program for the various school groups should be initiated.

VII. RESOURCE PROTECTION

VII-A. Insects & Disease - Inventory

Important Insect Pests on  
Mountain Home Demonstration State Forest

<u>Family</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Host(s)</u>
<i>Scolytidae</i>	western pine beetle	<i>Dendroctonus brevicomis</i>	p. pine
	mountain pine beetle	<i>Dendroctonus ponderosae</i>	s. pine p. pine
	red turpentine beetle	<i>Dendroctonus valens</i>	s. pine p. pine J. pine
	pine engraver beetle	<i>Ips</i> spp.	p. pine J. pine s. pine
	fir engraver beetle	<i>Scolytus ventralis</i>	w. fir r. fir
<i>Buprestidae</i>	California flatheaded borer	<i>Melanophila californica</i>	J. pine p. pine s. pine
	fir flatheaded borer	<i>Melanophila drummondi</i>	w. fir r. fir

Important Diseases Occurring on Mountain Home Demonstration State Forest

Diseases-Abiotic

Human Activities

Air Pollution

Diseases-Biotic

True Mistletoes

<u>Common Name</u>	<u>Scientific Name</u>	<u>Host(s)</u>
white fir mistletoe	<i>Phoradendron bolleanum</i> ssp. <i>pauciflorum</i>	w. fir

VII-A. Insects & Disease – continued

<u>Common-Name</u>	<u>Scientific-Name</u>	<u>Host(s)</u>
incense-cedar mistletoe	<i>Phoradendron juniperinum</i> ssp. <i>Liberdri</i>	i. cedar
oak mistletoe	<i>Phoradendron villosum</i>	oaks

Dwarf Mistletoes

<u>Common Name</u>	<u>Scientific Name</u>	<u>Host(s)</u>
True dwarf-mistletoe	<i>Arceuthobium abietinum</i>	w. fir
Sugar pine dwarf-mistletoe	<i>Arceuthobium californicum</i>	s. pine
Western dwarf-mistletoe	<i>Arceuthobium campylopodum</i>	p. pine J. pine

Root Diseases

<u>Common Name</u>	<u>Cause</u>	<u>Host(s)</u>
Annosus root disease	<i>Fomes annosus</i>	all conifers
Armillaria root disease	<i>Armillariella mellea</i>	all conifers oaks

Heart Rots

<u>Common Name</u>	<u>Cause</u>	<u>Host(s)</u>
Red ring rot	<i>Fomes pini</i>	D-fir true fir p.pine J. pine s.pine
red-brown stringy rot	<i>Echinodonium tinctorium</i> indian paint fungus	true fir D-fir (rarely)
dry pocket rot	<i>Polyporus amarus</i>	l-cedar
red-brown rot	<i>Polyporus schweinitzii</i> velvet top fungus	conifers D-fir & Pines
brown trunk rot	<i>Fomes officinalis</i> quinine conk quinine conk	p. pine J. pine s. pine

VII-A. Insects & Disease – continued

brown cubical rot	<i>Polyporus sulohureus</i> sulphur fungus	mainly true fir r. fir & oaks
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Rusts

<u>Common Name</u>	<u>Scientific Name</u>	<u>Host(s)</u>
White pine blister rust	<i>Cronartium ribicola</i>	sugar pine w. white pine

VII-A Insects and Disease - Management FrameworkBark Beetles

Bark beetles attack trees by boring through bark to the cambial region to lay eggs. The construction of the egg galleries causes injury and/or death of the host tree. Fungus introduced by the insects, causes additional injury and loss of wood fiber. Trees under stress are most susceptible to successful attack.

Methods for suppressing beetles directly have not always been successful. These methods have included removal of infested trees, felling and removal of infested trees, and felling and removal of bark which may then be burned, sprayed or left in the sun to dry. Bark beetles can travel large distances and may emerge before the attack is detected, therefore, expensive control may be worthless.

Human Activities

The use of heavy equipment in timber harvesting and road construction can cause damage via debarking, severing of roots, or burying of roots. These injuries weaken trees making them more susceptible to insects, diseases, and windthrow.

Activity around recreational sites may affect the growth and value of older conifers through soil compaction and scarring. Campground activities preclude seedlings and reduce the number of saplings and pole-sized trees. Often the butt portions of campground trees must be culled because of nails in the trees used for hanging clothing, lanterns, tents, etc.

Air Pollution - Ozone

Ozone (O<sub>3</sub>) is the most important cause of air pollutant damage to conifers. Ozone is developed primarily from automobile emissions. Two by-products of engine combustion, nitrogen dioxide (NO<sub>2</sub>) and gasoline vapors, react with sunlight to produce ozone in the atmosphere. Prevailing air currents move the pollution into the forest. While the amount of ozone for the last several years is decreasing, the amount of visible injury has been

increasing. Ozone affects needle retention. It does not usually cause the death of a tree, but predisposes it to attack from insects and disease.

There is some argument about the ranking of trees by sensitivity to ozone. Agricultural Handbook No. 521, *Diseases of Pacific Coast Conifers*, indicates that trees occurring on the State Forest, ranked from most sensitive to least sensitive are: 1) red fir, 2) ponderosa pine, 3) Jeffrey pine, 4) white fir, 5) incense-cedar, 6) sugar pine, and 7) giant sequoia.

#### True mistletoe

True mistletoes occur on conifer and broadleaf species. They are disseminated by birds. Mistletoe seeds are ingested then excreted onto a host tree. Because of this, true mistletoes are generally found in the tops of trees. True mistletoe is primarily a disease of older trees. It takes years to build up and become damaging.

#### Dwarf-mistletoe

Dwarf-mistletoe is a parasite almost wholly dependent on the host for food and water. Generally, dwarf-mistletoes do not kill their host, but predispose trees to attack by bark beetles or disease. Dwarf-mistletoes are host specific with long life cycles. The rate of spread through a stand is relatively slow.

#### Heart-rot

Heart rots are caused by fungi entering and destroying the heartwood. As a rule heart rots do not invade sound trees, but need an opening into the heartwood. Wounds caused by fire and human activity are common points of entry. Trees with heart rot are more prone to windthrown and breakage.

#### Root Diseases

##### Armillaria

Armillaria root disease is usually present in stands where oaks are present. Armillaria has a very wide host range. Most conifers in the west are at least moderately susceptible. The disease is dependent on diseased, weakened, or dead oaks for the growth of root-like structures called rhizomorphs. The creation of dead oak stumps increases the risk of infection.

##### Annosus

Annosus root rot is a root-rotting fungus to which all conifers in California are susceptible, most hardwoods are not. The disease may survive as long as 50 years in the soil as a saprophyte if trees are absent. Annosus is spread by spores and root contacts. Spores are carried by the wind and become established on freshly cut tree stumps and on basal wounds in fir. Root contacts with infected roots spread the disease outward. It will travel from pine to fir, but not fir to pine.

Annosus is an especially important problem on Mountain Home Demonstration State Forest because of the recreation program. The pines and firs will usually succumb to beetle attack after infection and be removed. Giant sequoia and incense-cedar are resistant to insect attack. Nevertheless, the fungus may rot most of their structural roots, yet the giant sequoia and incense-cedar show no outward indication. Such infected trees are susceptible to windthrow.

## Rusts

### White Pine Blister Rust

White pine blister rust, which is native to Asia, was introduced into the United States around 1900. The rust has been known to infect almost all species of white pine (the 5 needled pines) in the world, including sugar pine. Blister rust was discovered on the State Forest in 1968 by Dr. Philip G. Haddock, a visiting professor from the University of British Columbia. At that time the rust was confined to relatively small infection centers. Since then, the disease has spread throughout the forest and occurs on all sugar pine sites in the area.

In 1980 a survey of the blister rust infection on sugar pine was made in conjunction with the Continuous Forest Inventory remeasurement. The survey showed that 27% of the total number of sugar pine on the forest is infected with blister rust. Approximately 85 percent of the sugar pine around the State Forest Headquarters has been lost due to a combination of the blister rust and bark beetle attacks.

### Control Efforts

Starting in 1968 and continuing through the present time, the State Forest has actively pursued control measures for the disease in an effort to reduce the impact that this fungus can have on sugar pine. Initiated in 1968 and continuing for 10 years, a blister rust control strategy based on direct control was implemented.

Extensive scouting identified boundaries of the blister rust infection centers on the forest. Within these infection centers, trees with bole cankers or branches infected 12 inches or less from the bole were cut. Sugar pine crop trees were selected based on size, spacing, and resistance to the disease. All other trees were removed. Crop trees were pruned to a height of 18 feet. Almost all sugar pine less than 36 feet tall were removed from the infection centers. This work was accomplished by seasonal Forestry Aides and Mountain Home Conservation Camp inmate crews.

During the early stages of these control efforts, it was thought that the disease could be eradicated by thorough treatment in all infection centers. It became evident, however, that the problem was too extensive and cankers too difficult to detect for removal of all infections. By 1974 the control program had by no means eradicated the disease, but it was felt that some progress had been made in reduction of the overall problem. The number of infected trees in the main infection centers had been reduced. At that time, blister rust was mainly confined to the lower parts of the tree crowns and it

was felt that the remaining crop trees were protected from further infections because of the pruning efforts. The general timber stand improvement work had regulated stocking and increased the growth on the selected crop trees.

Starting in 1975 and continuing to the present, a marked increase in blister rust infections has been noted. Cankers were found higher in the tree crowns, many above the 18 foot pruning height. Bole cankers were more prevalent with increased mortality and top kill. The disease made a rapid spread to other areas of the forest and onto adjacent privately owned land. Control strategies were changed to a general timber stand improvement treatment in infected young growth stands with emphasis on selection of lightly infected or non-infected sugar pine for crop trees. Merchantable, (10 inches DBH and larger), infected sugar pine were no longer removed precommercially. It was felt that these trees would live long enough to be harvested in the next commercial entry into the stand. Intensive blister rust control work was confined to campgrounds and roadsides.

In 1981, blister rust control at MHDSF shifted directions to developing resistant planting stock through genetic selection. A total of eight superior trees were identified as having genetic resistance. Out plantings of these resistant trees were made in 12 test plots in 1983 and 1984. The known resistant trees carried a major gene resistance (MGR). The hope was that the resistance could be a temporary fix until a permanent solution to the blister rust problem could be discovered. These plantations seemed promising until 1996, when the virulent race of blister rust was discovered at MHDSF. The virulent race is capable of overcoming major gene resistance (MGR) in sugar pine. These MGR plantations are slowly being eliminated by the virulent race.

#### VII-A. Insects and Disease - Management Guidelines

1. Minimize losses to insects and disease by maintaining thrifty and vigorous trees by removing high risk trees in sanitation-salvage cuts and thinning dense stands.
2. Minimize injury to trees during logging operations: A) Favor harvesting later in the summer when bark is less likely to be removed easily. B) Designate skid trails prior to harvesting. C) Adequately administer sales to ensure a minimum of skin-ups. Limbing and bucking should be required prior to skidding. Skin-up trees will be evaluated by a qualified forest officer to determine if retention/removal is required.
3. Expose slash to direct sunlight to reduce *lps* buildup or time thinning and pruning operations for late summer or fall to prevent a buildup of a breeding population of *lps*.
4. Allow recreation area trees to grow and establish new seedlings, campgrounds or portions of campgrounds will need to be closed for ten to fifteen years on a rotational basis. Further study is needed to provide a schedule.

5. Develop handout material for campers to educate the public on the cost of camper impacts including nails, litter, and defacing trees.
6. Plant a mixture of conifer species, thereby avoiding monocultures and providing barriers to the host specific diseases.
7. Plant ozone tolerant species at lower elevations. Ponderosa pine should not be precluded, but rather not be the primary component planted at lower elevation sites. Giant sequoia or incense-cedar may eventually replace ponderosa pine as the primary species planted on the forest, if ozone damage continues to increase. Staff will continue to monitor the ozone levels for the USFS and the State Air Quality Control Board as long as these agencies see a need. Monitoring has been intermittent in recent years.
8. Where oaks are cut, sprouting will be allowed to keep the root system alive. Oak stumps should be no more than eight inches high for the most favorable results. Removing oak or conifer stumps will not be encouraged, since this control method has not been proven effective or economical in removing inoculum. Poisoning of oaks is to be avoided.
9. Favor pines in planting in and around known annosus centers. Do not plant incense-cedar or giant sequoia in known or suspected centers in recreation sites.
10. Treat freshly cut pine stumps with granular borax (sodium tetraborate decahydrate).
11. Use a two pronged approach to blister rust control:

A) Blister Rust Silvicultural Prescription

During harvesting activities, the opportunity exists to sanitize a sugar pine stand for blister rust infected trees and at the same time improve the genetic base of the remaining stand. We have developed a silvicultural prescription to be used at Mountain Home when marking sugar pine for harvest in areas affected by blister rust. The prescription allows for leaving non-infected or lightly infected trees (less than 20% of branches infected) that do not show any lethal infections. A lethal infection is defined as a canker on the stem or within 24 inches of the stem. If the canker is more than 4 inches from the bole the opportunity exists to prune the infected branch and keep the canker from reaching the stem and girdling the tree. We have found that pruning can be practicable only for the first 16 foot log in the tree due to the inordinate time and effort required for pruning above that height. Our prescription calls for leaving lightly infected trees with prunable lethal cankers in the lower 16 foot log if the decision is made to prune these trees following harvest operations.

The flow chart, Illustration VII-B-1, shows the decision making process involved in determining whether a sugar pine will be cut or left during timber harvesting on a given area.

FLOW CHART FOR MAKING SILVICULTURAL DECISIONS FOR  
COMMERCIAL SALE PREPARATION IN A BLISTER  
RUST INFECTED SUGAR PINE STAND

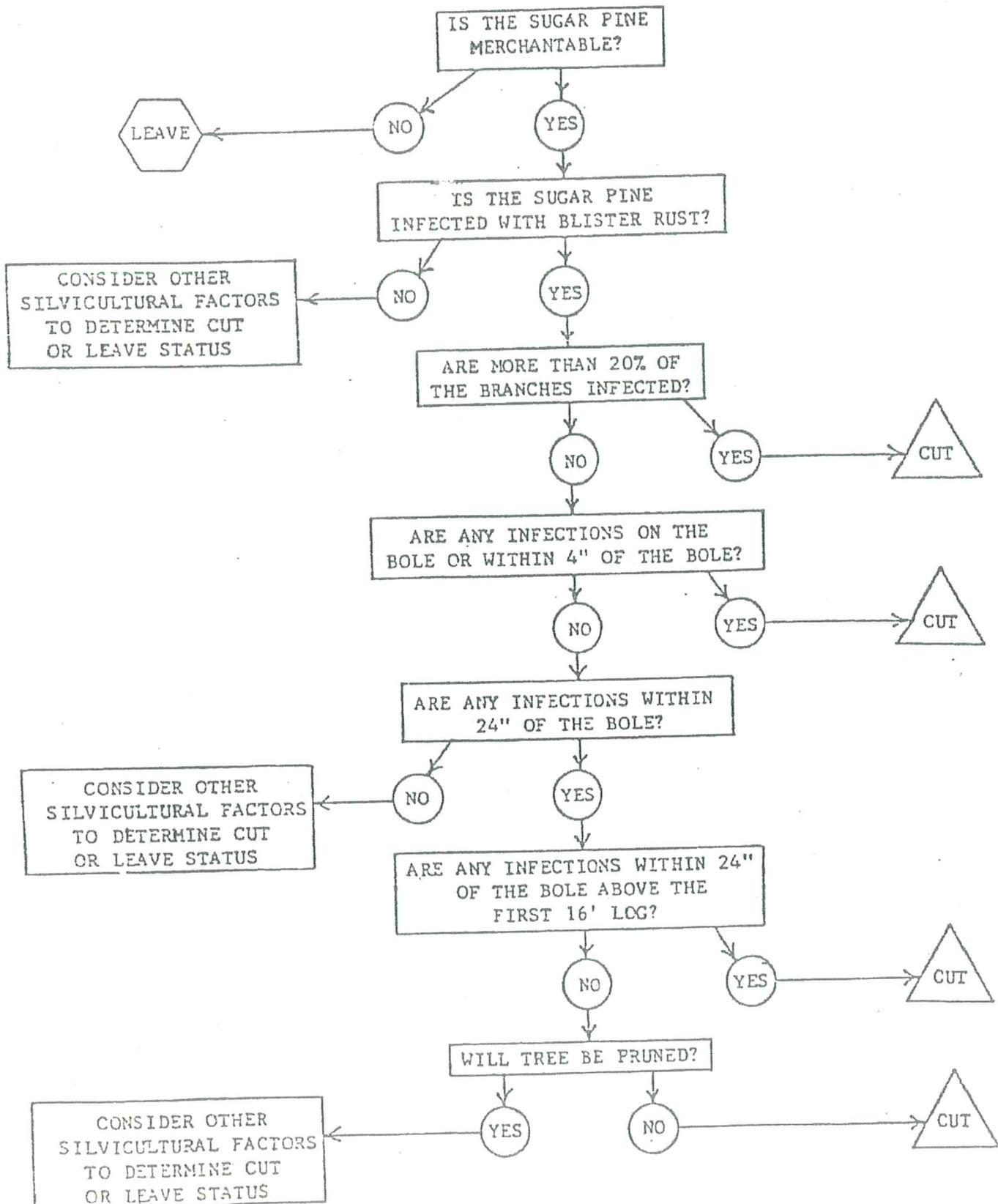


Illustration VII-B-1

## B) Genetic Selection Program

At present, the hope for finding genetic resistance lies with the 26 potential ontogenetic sugar pine trees that were identified during the initial genetic selection. These trees do not carry the MGR gene but have some other type of resistance. The goal for the future is to secure funding and develop a study design for out plantings that could assist in identifying the resistance mechanism. Cones will be collected from these trees for a future project.

## VII-B. Animal Damage

Animal damage occurring on the forest can normally be attributed to either pocket gophers (*Thomomys* spp.) or deer (*Odocoileus heimonus*). Deer browsing has not been a significant problem on the forest. There appears to be a very small resident population. The few Douglas-fir (*Pseudotsuga menziesii*) are the only trees moderately browsed.

Where necessary, deer browsing could be reduced by spraying with an approved deer repellent. Pocket gophers are not normally a forest resident. They prefer open areas where their principle food grows in abundance. They eat primarily grasses and broad-leafed herbs. Extensive burrow systems are dug in the root zone area for feeding purposes. Logging may increase gopher habitat by expanding meadow and grassy areas. Planted trees may be damaged or killed by gophers cutting the roots. Pocket gophers will forage near their burrow openings and burrow through snow to gnaw the bark of young trees. Fan shaped sounds and earth cores (winter casts) left from the snow tunneling are indications of pocket gopher activity.

Gophers may be controlled by vegetation management or by poison baits. Removal of grasses prior to planting is usually sufficient to cause gophers to move.

## VII-C. Fire Protection

Fire occurrence on the forest is low. A significant fire event has not occurred in the Mountain Home area in over 100 years. Most fires that have occurred on the State Forest originated from are illegal campfires or were started by careless smokers. A five-acre fire has been the largest in the last decade and was started by a careless smoker on a hiking trail. Fire prevention, fire suppression, and appurtenant law enforcement is the key to averting significant fire events on the State Forest. This responsibility falls on the the State Forest Manager.

Mountain Home Demonstration State Forest staff will take prompt and necessary action on fires occurring upon or closely adjacent to Mountain Home Demonstration State Forest. Upon the arrival of a Tulare Unit fire control representative, control and patrol activities pertaining to the fire will become his or her responsibility. State Forest staff and equipment will be available as needed.

During fire season, all permanent forest personnel are on call at night as required for their State Work Week Group. Forest personnel will be fire-trained, if possible.

During the summer weekends, the forest will be patrolled by the Mountain Home Demonstration State Forest Assistant Forest Manager. It will be his/her responsibility to meet people, explain State Forest rules and regulations, and report and take appropriate action on fires occurring on the State Forest..

The Mountain Home Demonstration State Forest fire defense plan is shown in Appendix B-10. The plan gives the location of fuelbreaks, roads, structures, and sources of water.

## VIII. OTHER MANAGEMENT FACTORS

### VIII-A. Range Management

#### History

The State Forest area has had a long history of livestock use dating back over 100 years. The forest was used extensively by livestock until State acquisition in 1946. At that time the effects of severe overgrazing were evident throughout the State Forest, especially in meadow areas. Species composition had changed drastically in meadow areas and water tables had been lowered by the cutting of stream channels due to livestock trampling. Soon after State acquisition, drift fences were installed and livestock trespassing was controlled. No grazing permits have ever been issued by the State within the forest, although grazing has occurred over the years from occasional trespass cattle from adjacent USFS grazing permits and nearby private land.

#### Inventory

A grazing survey of the State Forest was completed in 1956. After ten years of restricted livestock use, the meadow areas showed marked recovery from past abuses. Forage values for both the forest and meadow ecosystems were estimated and the grazing capacity was calculated. At that time the total forest grazing capacity was estimated to be 80 animal unit months. The 37 acres of meadows had a capacity of 26 animal unit months and the forested area 54 animal unit months. Since livestock will tend to concentrate their forage use almost exclusively in the meadow areas, the actual carrying capacity of the forest was given to be 26 animal unit months. Because of the low carrying capacity of the forest and the conflicts between grazing and the other uses of the State Forest, especially recreation, the report recommended that grazing not be allowed on the forest.

## Management Framework

The range conditions on the State Forest have changed since the grazing survey of 1956. An updated grazing study should be accomplished to determine the current potential for livestock use on the forest. It is estimated that the carrying capacity of the State Forest has increased somewhat due to continued rehabilitation from historical grazing abuse. Some conflicts may exist between recreation use and livestock grazing. This is especially true since campgrounds have been constructed adjacent to prime grazing areas of Balch Park Meadows, Methuselah Meadows, and Frasier Mill. Fencing of meadows would eliminate livestock entry into campground areas, although this would entail a substantial investment in capital and maintenance costs.

It has been found, in some forested areas, that grazing can be used to advantage for vegetation control in young stands. Any type of livestock management would probably require fencing to restrict stock to certain areas. The absolute benefits of increased tree growth from having livestock control the vegetation on the State Forest is unknown.

Income from the issuance of grazing permits would be low because of the small carrying capacity of the forest and the low dollar value for forage. Based on the current U.S. Forest Service rates for forage use of \$1.43 per Animal Unit Month, the total gross income to the State Forest for livestock use would be \$36.77 per year.

1. Because of the low value to the State for livestock use and potential conflicts in recreation areas, it is recommended that grazing should not be permitted on a forest-wide basis.
2. The existing drift fence system should be maintained to exclude cattle from adjacent private land and U. S. Forest Service permittees.
3. Update the 1956 grazing study with a new survey and calculate an updated carrying capacity for livestock use. The main purpose of a new forage survey would be to follow the trends of rehabilitation of the meadow system from past overgrazing and identify stands that could be fenced for vegetation control.
4. Evaluate the cost of building and maintaining fences in some areas against the benefits of increased tree growth due to reduced brush and grass competition.

## VIII-B. Fisheries

Trout occur in the larger streams and ponds on the State Forest. The two man-made ponds on the forest, Hedrick and Balch Park Upper, are stocked with rainbow trout during the summer months by the California Department of Fish and Game. These ponds constitute a basic "put and take" fishery with heavy fishing pressure and few carry over fish in winter. Various species of minnows and shiners have become established in these ponds.

Streams containing trout on the forest include: Bear Creek below Frasier Mill Campground; Coburn Creek below Hedrick Pond; Park Fork of Bear Creek below Balch Park; North Fork of the Middle Fork of the Tulare River; Galena Creek below 6000 foot elevation; and Silver Creek below 6000 foot elevation. The North Fork of the Middle Fork of the Tule River is stocked with rainbow trout periodically during the summer. All other streams contain self-sustaining native populations.

Species List:

Rainbow Trout..... *Salmo gairderin*  
Eastern Brook Trout..... *Salvelinus fontinalis*  
Brown Trout ..... *Salmo trutta*

Management Guidelines

Degradation of the fisheries resources can occur if stream or pond environments are altered by timber harvesting or road construction activities. Adequate watercourse protection zones shall be incorporated in timber sale planning adjacent to fisheries resources. Overstory and understory vegetation shall be retained in sufficient amounts within the protection zones so that water temperatures will not rise beyond acceptable levels. Deposition of any substances in streams or ponds which will degrade fish habitat shall be avoided. Road crossing of streams must be designed to allow passage if needed.

VIII-C. Wildlife

Inventory

A list of wildlife that could potentially inhabit the Forest is included in Appendix B.

Management Framework

The Forest is open to hunting for regulated game species. A small closed area exists around Balch Park and State Forest Headquarters to protect the occupants of this high use area.

Consultation with local Department of Fish and Game Wildlife Biologists has shown that our existing management schemes are providing adequate wildlife protection. The selective method of harvesting with small, scattered clearcuts is providing a mosaic of understory and overstory vegetation adequate for cover and feed of wildlife species. Timber harvesting will continue to provide new brush sprouts and herbaceous vegetation needed for many wildlife species.

### Management Guidelines

1. Retention of oaks where they are a minor component of the existing stand.
2. Grass seed landings and major skid trails planned for reuse to provide an additional food source for wildlife.
3. Close off roads not needed for management to reduce hunting pressure in given areas.
4. Accomplish prompt regeneration, which will eliminate the need for the use of chemicals for site prep on brushy sites, and allow the brush to sprout underneath established regeneration.
5. Enlargement of meadows by the cutting of encroaching trees and other vegetation.
6. Retain snags and down woody material as allowed by the Forest Practice Rules. Attempt to maintain a minimum of 3 snags and 3 dead and down logs per acre in recent cutover areas.
7. Further study is needed on the inventory of any sensitive species that may occur on the State Forest, including critical habitat.

## VIII-D. Archaeological Resources

### Inventory

Starting in 1979, archaeological surveys of potential timber sale areas were performed by professional archaeologists and sites within those areas recorded and protected. In 1982 and 1983 a seasonal archaeologist was hired to do a complete survey of the forest and record all known sites. During that major survey effort, 26 sites were found and recorded. To date, a total of 22 prehistoric and 14 historic archaeological sites have been recorded on MHDSF. The prehistoric sites consist of bedrock mortars, bedrock basins, lithic scatters, or combinations of the three. The historic (Euro-American) sites that have been recorded consist mainly of early sawmill remains and historic trees and stumps. More sites may undoubtedly be found throughout the forest, especially during timber sale activities.

These archaeological sites are extremely important forest resources. They are an irreplaceable source of information providing clues about the historic and prehistoric occupation of the area, as well as having aesthetic and recreational values for forest visitors.

### Cultural History

Mountain Home Demonstration State Forest lies within the domain of the ethnographically recorded Foothill Yokuts Indian group. The Yokuts are unique among the California natives in the respect that they are divided into true tribes. Each has a name, a dialect, and a territory. Their territories were patchy and discontinuous.

One of these southern Foothill Yokuts tribes was known as the Yawdanchi or Yawdanchi. The principal territory of the Yawdanchi was the north fork of the Tule River, north and northeast of Springville. Mountain Home State Forest was formerly part of Yawdanchi territory although other groups including the Western Mono, Paiute, and Tabatulabal are said to have had access to the area (Otter 1693:11). The high elevation dictated a seasonal (mainly summer) occupation. Aside from being a welcome retreat from the hot valley summers, the area around Mountain Home provided good sources of vegetal foods such as black oak acorns and sugar pine nuts.

Although much is known about the Yawdanchi, very little is known about their use of the upper mountains and their origins. The Yawdanchi and their ancestors are the last Native Americans to occupy the area, not the only ones to do so.

The mysterious prehistoric cultures which preceded the Yawdanchi are known only through archaeological investigations. The bedrock basins and associated archaeological remains collectively are one of the most enigmatic phenomena in the Sierra Nevada. These resources are unique even in worldwide perspective.

### Management Guidelines

1. All known sites on the Forest shall be protected during all management activities, especially road construction and logging. Procedures for avoidance of effects to cultural resources will be followed (Appendix C). Specific protective measures for individual sites may also be prescribed.
2. The cultural resource sites should also be managed for their information content. Studies including surface collections, test excavations, site mapping and other projects should be encouraged when appropriate. These activities must be approved in advance by the Forest Manager and the CDF Archaeologist. Through archaeological studies we will develop the interpretive value to these resources to the benefit of our forest users.
3. In general, there shall be a "no collecting" policy on the forest with respect to archaeological artifacts and materials. Flakes, manos, pestles, pot sherds, and other commonly-occurring specimens such as projectile points, decorated pot sherds, shell objects, or bone tools may be collected when appropriate. The exact location of the recovery must be documented and the material forwarded to a CDF Archaeologist for recordation and analysis.
4. An interpretive display should be developed for the public located at a Visitors Center at the State Forest Headquarters. Artifacts recovered during previous surveys will eventually be curated on the forest for public display and enjoyment.

There should be printed pamphlets to accompany the display, which outline the forest policy concerning collections and site protection. We want to encourage the public to enjoy, visit, and learn from the forest sites, but we also want to emphasize the rules which govern them. An artifact display could tend to encourage illegal collecting and digging if the policies were not also displayed.

5. Interpretive trails and signs on archaeological and historical sites should be maintained and developed. The location and wording used for the signs and trails should be selected in consultation with the CDF Archaeologist in order to mitigate potential losses from collecting, and to select the appropriate language on the signs (bedrock mortars instead of "Indian Grinding Holes").

### VIII-E. Roads

#### Road Management Plan

##### Introduction

Roads and road maintenance are an important part of the management of Mountain Home Demonstration State Forest (MHDSF). Roads provide access for recreation users, timber management, fire control, experimental and

demonstrational projects, and for other administrative uses. Roads can also be a major source of management related sediment sources. Construction design, location, and maintenance are key factors in reducing soil erosion and providing serviceability of forest roads. Roads within MHDSF vary in age from over 100 years to less than 10 years and were built to various construction standards. The California Department of Forestry and Fire Protection (CDF) or private contractors built the majority of roads on MHDSF from 1946 to 1992. The road system on MHDSF is now complete and no new road construction is planned for the life of this road management plan. The goal of the plan is to provide guidelines for inventory, inspection, maintenance, and management of the forest road system. The road management plan will remain in effect until a new land management plan is prepared for the State Forest. At that time, it will be updated and included as part of the revised land management plan.

### Road and Stream Crossing Inventory

- The inventory of roads and stream crossings will provide a basis for maintaining and mitigating the road system at MHDSF. It will allow managers to identify problems that can be corrected through routine maintenance activities and assign maintenance and mitigation priorities to road segments and crossings. The inventory will be an intensive evaluation of all roads, drainage facilities, and crossings.

During the first year of this plan all existing roads and crossings on the State Forest will be inventoried. CDF estimates that the road system on MHDSF totals approximately 31 miles. The current road inventory listed in Appendix D-1 identifies roads in three categories, main timber access roads, spur timber access roads, and temporary roads. The roads in this list are denoted by a descriptive name, i.e. River Road. Each of the listed roads has a starting and ending point that is easily identified on a map and on the ground. These listed roads will be used as the basic unit for the proposed road inventory.

State Forest personnel will accomplish the inventory. Geologists or other appropriately licensed engineers or earth scientists will be utilized where evaluation of unstable areas requires geologic and/or other specialized expertise.

The paved roads on the forest, with the exception of the Summer Headquarters Driveway, are maintained by Tulare County and will not be considered in this road management plan.

The following attributes will be noted for each road. A form has been developed to record the road inventory data (see Appendix D-2).

1. Road name – Descriptive road name, including starting and ending points.
2. Length of road – In miles to the nearest hundredth.
3. Category
  - A. Main seasonal road – A road that serves as a main haul route for timber or provides access to a recreation area. This class of road will typically have some sort of road surface such as rock or road oil that provides for an all weather surface.

- B. Spur seasonal road – A road that is used to access timber or provides recreational access and leads to a main timber access road or County Road. This road will provide access for dispersed recreation activities such as hunting and sightseeing. The traveling surface will typically be dirt and not suitable for all weather travel.
  - C. Temporary road – A road that is used for a specific project, such as a timber sale and then closed to public travel and abandoned. Erosion control structures present require little or no maintenance.
4. Usage – High applies to roads used more than once per day during the summer, medium applies to roads used less than once per day during the summer, and light applies to those roads used less than once per month.
  5. Road Drainage – Indicate whether road is drained with waterbars, rolling dips, overside drains, inside ditchline with cross drains, or a combination of methods.
  6. Width of roadbed – Average width of road from shoulder to shoulder and includes the running surface, berm and ditch (if present).
  7. Surface – (soil, rock, road oil, chip seal, etc.) If the type is not consistent for entire road, note in segments measured in hundredths of miles from the starting point.
  8. Road grade – Expressed in percent. Where there is a significant change in grade (5% or greater) it should be noted in segments measured in hundredths of miles from the starting point of the road.
  9. Parent material – Based on soil maps or visual observation of road cuts. If a change in parent material occurs along the road the change should be noted in segments measured in hundredths of miles from the starting point.
  10. Mass wasting features – Note any features such as fillslope and cutslope mass failures, and indicators of potential failures such as tension cracks.
  11. Surface erosion features – Note significant gullying (6 inches or greater in depth).
  12. Sediment delivery hazard areas – Note areas of potential sediment transport to watercourses such as ditch outlets with little or no filter strip or portions of roads within the watercourse protection zone.
  13. Culvert inventory
    - A. Location in hundredths of miles from starting point.
    - B. Diameter
    - C. Cross drain or watercourse crossing
    - D. Condition (plugged (%), bypassed, crushed inlet/outlet (%), degree of corrosion, serviceable, alignment, piping, scour at inlet/outlet)
    - E. Diversion potential – Note if stream will be diverted out of its channel and down the roadway if the culvert were to become plugged.
    - F. Fish passage –obvious problems will be noted
    - G. Maximum head present – height from bottom of the culvert inlet to the overflow elevation at the road crest.

14. Oversight drain inventory
  - A. Location in hundredths of miles from starting point
  - B. Condition (plugged, crushed, bypassed, serviceable)
15. Other road structures – Bridges, gates etc. Note location and condition.
16. Crossings
  - A. Note location in hundredths of miles from starting point.
  - B. Type (culvert, bridge, ford)
  - C. Watercourse Class (I, II, III)
  - D. Upstream debris potential
17. Any special maintenance or design problems such as ineffective water bars or rolling dips, standing water, rocks in roadbed, etc.

### Construction and Design Standards

No new road construction or reconstruction is planned for the life of this road management plan, therefore no road construction and design standards are included.

### Road Surfacing Specifications

#### Main Seasonal Roads

Main seasonal roads shall be surfaced with at least 4 inches of crushed rock meeting the specification for Class II road base. This road base will provide for a firm running surface and reduction of erosion of the native soil roadbed. If the crushed rock surface becomes eroded or degraded over time, additional material will be applied to maintain a firm running surface. The following roads, listed in priority, will have road base applied to the running surface as time and finances are available.

1. Summit road – Mile 1 to Mile 2.3
2. River Road – Start to Mile 0.2 and Mile 0.5 to End
3. Moses Gulch Road – Entire length

Dust treatments on main seasonal access roads will consist of watering, road oil, or polymer emulsions. Dust treatments will be applied to these roads in conjunction with timber harvesting activities. Specific dust treatments will be prescribed in the Timber Harvesting Plan for each individual timber sale. Road oil or polymer emulsions will be applied to all or portions of main seasonal roads by CDF when log hauling is not occurring and dust conditions become excessive for recreational users and administrative traffic.

#### Spur Seasonal Roads

Spur seasonal roads will be native soil surfaced. Crushed rock road base may be applied to selected segments of these roads to facilitate drainage, cover rocks, fill holes, etc. Specific segments of spur seasonal roads to be rocked, in priority order,

are shown below. Additional segments may be identified upon completion of the road inventory.

1. Bogus Meadow Road – Junction with Camp Lena Road to Mile .2
2. California Stump Road – Mile .1 to End
3. Tub Flats Road – Start to Mile .4
4. North Balch Road – Mile .3 to Mile .5

Dust treatments such as watering, road oil, or polymer emulsions may be applied to selected segments of spur seasonal roads when increased traffic occurs from timber harvesting. Specific dust treatments will be prescribed for each individual timber sale in the Timber Harvesting Plan. Additionally road oil or polymer emulsions may be applied to all or portions of spur seasonal roads by CDF when log hauling is not occurring and dust conditions become excessive for recreational users and administrative traffic.

#### Temporary Roads

Surface on temporary roads will be native soil material. No rocking will be done on the running surface of temporary roads. Dust treatment will consist of watering for specific timber sales and will be specified in the Timber Harvesting Plan.

#### Road Use Restrictions

Log hauling will not be accomplished during any time of the year when any of the following conditions exist:

1. Equipment is unable to operate under its own power.
2. Equipment causes rutting of road surface producing channels for sediment transportation.
3. Pumping of fine sediment allows material to enter inside ditches and cause turbid water to flow in ditchlines.

Blading roads to reduce surface moisture conditions for improving driveability for log trucks will not be permitted.

Gating of the entire soil surfaced road system will occur when, in the opinion of the Forest Manager, light vehicles have the potential to cause significant rutting of the road surface. Roads will typically be gated after the first significant precipitation occurs in the fall until the snowpack melts off the road surface in spring and the road surface is dry enough to support vehicle traffic without rutting.

In order to accomplish the gating of all soil surfaced roads as explained above, the following roads will need gates installed at the entry points from the County Road.

1. North Balch Road
2. Bogus Meadow Road
3. Powerline Road

A gate is also proposed at the Tule River Crossing at Hidden Falls to control access to the low water crossing of the river when water is flowing over the concrete slab.

Gates are already present at the following locations and will be maintained:

1. Methuselah Campground Road
2. Powderhouse Road
3. Summit Road
4. Lace Meadow Road
5. Camp Lena Road
6. Section 34 Road
7. Headquarters Driveway
8. Rock Crusher Road
9. Galena Road
10. Old Bear Creek Road
11. Coburn Mill Road
12. Hedrick Spring Road
13. Section 26 Road

Two roads will be abandoned to prevent winter access from the paved County Road. They are the Hammer Valley Road and Garbage Bin Road. Details for road abandonment are outlined in the road abandonment section of this plan.

Water drafting from Class I watercourses or ponds for dust abatement on forest roads or other uses will require that the following measures are followed: 1) all water intakes are properly screened to prevent harming small fish or amphibians, 2) points of access for drafting are identified in the Timber Harvesting Plan for all timber harvesting projects, and 3) the rate of drafting will be modified or halted if necessary to assure no visible drop in the water surface of the waterbody.

#### Road Inspection and Maintenance Program

Proper maintenance is the key to reducing long-term contribution of roads to stream sediment. The maintenance program at MHDSF will be based on the road and culvert survey, and an inspection program which will provide the information base for setting maintenance priorities.

Properly abandoned roads will be inspected at least twice following the completion of the abandonment. The first inspection will be after the first over-wintering period. The second inspection will follow a significant stressing storm event. A significant stressing storm is defined as rainfall exceeding the 2 year 1-hour rainfall intensity (greater than .70 inches of rain recorded in one hour at the Mountain Home precipitation gauge maintained by the Corp of Engineers).

Active roads will be inspected yearly to ensure that drainage facilities and structures are properly functioning, gates are secure, no failures of cut or fill slopes has occurred, and road surfacing is intact. Information collected from the inspections will be entered on the forest road inventory database and maintenance personnel will be advised immediately of important hazards. Identified problems will be corrected before the onset of wet weather whenever possible and appropriate, depending on availability of personnel and equipment.

Grading will be accomplished on an "as needed" basis based on the yearly road inspection and log hauling activity. If log hauling is occurring, grading will be done on a periodic basis as specified in the Timber Harvest Plan. CDF or contractors will also accomplish grading when necessary to restore drainage and provide for a smooth running surface. Excessive grading of running surfaces, inside ditches, and cutslopes will be avoided. When possible, vegetation will be left on or above

cutslopes to stabilize the slope. Vegetation may be removed when: 1) needed to improve visibility, 2) provide clearance, and 3) hazard trees may fall in the roadway.

Culvert entrances will be cleaned yearly and, where appropriate, excavated to provide a sediment trap at the culvert head.

### Road Abandonment Plan

All roads on MHDSF that are no longer required for management and recreational purposes will be considered for abandonment. Roads to be abandoned will include temporary roads and also roads to be permanently closed. Temporary roads can be defined as roads that are used for one or two years for timber sale activity and then abandoned. They may be reopened and reused in the next timber sale entry. Permanently closed roads are those roads that have no planned future use.

Road abandonment means actively treating a road to reduce erosion potential and eliminate the need for periodic maintenance. Future vehicular use of these roads is not intended after closure. Abandonment will include the following:

1. Removing culverts or other temporary crossings and reestablishing channels to their original grade. The road prism will be pulled back to a stable configuration. Where necessary, the regraded channel will be armored to prevent downcutting or erosion of the old fill material.
2. Where possible, the surface of abandoned roads will be outsloped.
3. Rolling dips, waterbars, or other self-maintaining drainage structures will be installed at appropriate locations as needed to establish drainage and prevent erosion.
4. Potentially unstable fills will be pulled back and graded to a stable configuration, mulched, and seeded.
5. Entry points for abandoned roads will be closed with large logs or rocks.

The following roads, listed in order of priority, will be considered temporary roads and will be abandoned as resources and financing permits according to the standards mentioned above:

1. Hidden Falls Spring Spur
2. West Summit Spur
3. Japan Tree Road
4. Loop Trail Road

The following roads, listed in order of priority, will be permanently closed:

1. Garbage Bin Road – Mile .1 to Bear Creek Road
2. Frasier Mill Water System Road – Mile .1 to end
3. Hammer Valley Road- Camp Lena Road to Frasier Mill D Loop
4. Powerline Road – Mile .3 to Forest Boundary
5. Living Dead Tree Road

Schedule/Funding for Road Network Improvement Activities

CDF will complete the road inventory work during the summer of 2000 using existing staff and operating funds.

Road surfacing is planned for the spring/summer of 2000 utilizing \$20,000 in special operating funds allocated from Sacramento. Additional funding in the amount of \$25,000 per year in road maintenance and improvement funds is proposed in a fiscal year 2000/2001 budget change proposal. In addition, road maintenance and improvement is planned as part of timber sale activity in 2000, 2001, and 2002. CDF will supply Heavy Equipment Operators and equipment to improve road sites when possible.

## Appendix D-1

### Mountain Home Demonstration State Forest Road Inventory

#### Main Seasonal Roads

Summit Road: Balch Park Road jct. to Pack Station  
River Road: Summit Road jct. to Hidden Falls  
Camp Lena Road: County Road (end of blacktop) to Summit Road  
Moses Gulch Road: River Road to Moses Gulch Campground  
Headquarters Driveway: Bear Creek Road to end  
Methuselah Campground Road: Bear Creek Road to Methuselah Campground  
Frasier Mill Campground A Loop  
Frasier Mill Campground B Loop  
Frasier Mill Campground C Loop  
Frasier Mill Campground D Loop  
Frasier Mill Campground E Loop  
Shake Camp Road: Pack Station to Campground  
Hedrick Pond Campground Road  
Old Mt. Home Picnic Area

#### Spur Seasonal Roads

Powerline Road: Bear Creek Road to end  
Old Bear Creek Road: Headquarters Driveway to Forest Boundary  
Bear Creek Spur: Old Bear Creek Road to end  
Coburn Mill Road: Headquarters to Old Bear Creek Road  
Powderhouse Road: Bear Creek Road to Headquarters  
Swedish Tree Road: Dogwood Meadow Road to end  
Dogwood Meadow Road: Summit Road (lower) to Summit Road  
East Dogwood Meadow Spur: Dogwood Meadow road to end  
Vantage Point Road: Summit Road to end  
Lace Meadow Road: Summit Road to Bear Creek Road  
Section 34 Road: Balch Park Road to Breckenridge Gate  
Old Frasier Grade: Section 34 Road to Forest Boundary  
Lindley Road: Old Frasier Grade to Forest Boundary  
Dome Rock Road: Forest Boundary to Dome Rock  
Frasier Mill Water System Road: Camp Lena Road to end  
Bogus Meadow Road: Camp Lena Road to end  
Tub Flats Road: Camp Lena Road to end  
Miller Road: Tub Flats Road to end  
California Stump Road: Camp Lena Road to end  
Hedrick Spring Road: Bear Creek Road to end  
Mosquito Pond Road: Camp Lena Road to California Stump Road  
Shake Water Tank Road: Campground to end  
Copper Mine Road: River Road to Forest Boundary  
Copper Mine Spur: Copper Mine Road to end  
Jacks Road: River Road to Moses Gulch Road  
Upper Moses Gulch Road: River Road to end

Upper Moses Gulch Spur: Upper Moses Gulch Road to end  
McAnlis Road: Hidden Falls to McAnlis Trail  
Galena Creek Road: McAnlis Road to end  
McAnlis Middle Spur: McAnlis Road to end  
North Balch Road: Bear Creek Road to end  
Rock Crusher Road: Summit Road to end  
Garbage Bin Road: Methuselah Campground Road to end  
D-Loop Spur  
Section 34 – Willis Road: Section 34 Road to Forest Boundary

Temporary Roads

Dome Rock Spur: Dome Rock Road to end  
Japan Tree Road: Dogwood Meadow Road to end  
Loop Trail Road: Shake Water Tank Road to end  
Hidden Falls Spring Spur: McAnlis Road to end  
West Summit Spur: Summit Road to end  
Upper Lace Spur

Roads to be Closed

Living Dead Tree Road: Summit Road to end  
Hammer Valley Road: Camp Lena Road to Frasier Mill D Loop  
Frasier Mill Water System Road: Mile 0.1 to end  
Garbage Bin Road: Mile 0.1 to Bear Creek Road  
Powerline Road: Mile 0.3 to Forest Boundary



Road Inventory Record Form (Cont.)

Road Name \_\_\_\_\_ Date \_\_\_\_\_

Culverts: (Cont.)

Mile _____	Dia. _____ in.	Cross Drain	Crossing	Condition _____
Mile _____	Dia. _____ in.	Cross Drain	Crossing	Condition _____
Mile _____	Dia. _____ in.	Cross Drain	Crossing	Condition _____
Mile _____	Dia. _____ in.	Cross Drain	Crossing	Condition _____
Mile _____	Dia. _____ in.	Cross Drain	Crossing	Condition _____
Mile _____	Dia. _____ in.	Cross Drain	Crossing	Condition _____
Mile _____	Dia. _____ in.	Cross Drain	Crossing	Condition _____
Mile _____	Dia. _____ in.	Cross Drain	Crossing	Condition _____

Overside Drains:

Mile _____	Condition _____

Other road structures:

Description \_\_\_\_\_ Mile \_\_\_\_\_  
 Condition \_\_\_\_\_

Watercourse Crossings:

Mile _____	Culvert	Ford	Bridge	Class I	Class II	Class III
Debris Potential _____						
Diversion Potential _____						

Mile _____	Culvert	Ford	Bridge	Class I	Class II	Class III
Debris Potential _____						
Diversion Potential _____						

Road Inventory Record Form (cont.)

Road Name \_\_\_\_\_ Date \_\_\_\_\_

Watercourse Crossings (cont.)

Mile \_\_\_\_\_ Culvert Ford Bridge Class I Class II Class III  
 Debris Potential \_\_\_\_\_  
 Diversion Potential \_\_\_\_\_

Mile \_\_\_\_\_ Culvert Ford Bridge Class I Class II Class III  
 Debris Potential \_\_\_\_\_  
 Diversion Potential \_\_\_\_\_

Mile \_\_\_\_\_ Culvert Ford Bridge Class I Class II Class III  
 Debris Potential \_\_\_\_\_  
 Diversion Potential \_\_\_\_\_

Mile \_\_\_\_\_ Culvert Ford Bridge Class I Class II Class III  
 Debris Potential \_\_\_\_\_  
 Diversion Potential \_\_\_\_\_

Mile \_\_\_\_\_ Culvert Ford Bridge Class I Class II Class III  
 Debris Potential \_\_\_\_\_  
 Diversion Potential \_\_\_\_\_

Mile \_\_\_\_\_ Culvert Ford Bridge Class I Class II Class III  
 Debris Potential \_\_\_\_\_  
 Diversion Potential \_\_\_\_\_

Mile \_\_\_\_\_ Culvert Ford Bridge Class I Class II Class III  
 Debris Potential \_\_\_\_\_  
 Diversion Potential \_\_\_\_\_

Sediment Delivery Hazard Areas:

Mile \_\_\_\_\_ Comments \_\_\_\_\_

Mile \_\_\_\_\_ Comments \_\_\_\_\_

Special Maintenance, design problems, other comments:

\_\_\_\_\_

#### VIII-F. Prescribed Fire

Prescribed fire is being used extensively in many giant sequoia stands to stimulate reproduction and reduce fuel loading. This is mainly being done in parks where timber harvesting is not an option in their management. Furthermore, prescribed fire will most likely be emphasized on the newly designated Giant Sequoia National Monument, which nearly surrounds the State Forest. On the State Forest, timber harvesting is providing the needed soil disturbance for giant sequoia reproduction. Therefore, prescribed fire will be used in certain situations to reduce fuel loadings, provide for a mineral soil seedbed and provide heat to open giant sequoia cones. In recent cutover areas, broadcast burning may be used in prepared locations to reduce the fire hazard from the slash and prepare these areas for planting. Broadcast burning may also be used periodically as a management tool in fuelbreak maintenance.

Prescribed fire has been used experimentally in the Moses Mountain study area to compare giant sequoia reproduction following fire and logging activity. The results of this study were published in California Forestry Note Number 111, 1998.



APPENDIXES

CALIFORNIA WILDLIFE AND THEIR HABITATS:  
WESTERN SIERRA NEVADA  
GENERAL TECHNICAL REPORT PSW-37

Wildlife Species List

Mountain Home Demonstration State Forest

Mammals

Vagrant Shrew – *Sorex vagrans*  
Trowbridge's Shrew – *Sorex trowbridgii*  
Broad-footed Mole – *Scapanus latimanus*  
Little Brown Myotis – *Myotis lucifugus*  
Yuma Myotis – *Myotis yumanensis*  
Long-eared Myotis – *Myotis evotis*  
Fringed Myotis – *Myotis thysanodes*  
Long-legged Myotis – *Myotis volans*  
California Myotis – *Myotis californicus*  
Silver-haired Bat – *Lasionycteris noctivagans*  
Big Brown Bat – *Eptesicus fuscus*  
Red Bat – *Lasiurus borealis*  
Hoary Bat – *Lasiurus cinereus*  
Spotted Bat – *Euderma maculatum*  
Townsend's Big-eared Bat – *Plecotus townsendii*  
Brazilian Free-tailed Bat – *Tadarida brasiliensis*  
Snowshoe Hare – *Lepus americanus*  
Black-tailed Jackrabbit – *Lepus californicus*  
Merriam's Chipmunk – *Eutamias merriami*  
Lodgepole Chipmunk – *Eutamias speciosus*  
California Ground Squirrel – *Spermophilus beecheyi*  
Golden-mantled Ground Squirrel – *Spermophilus lateralis*  
Western Gray Squirrel – *Sciurus griseus*  
Ringtailed Cat – *Bassariscus astutus*

Appendix B-1

## Wildlife Species List

### Mammals

Douglas' Squirrel – *Tamiasciurus douglasii*  
Northern Flying Squirrel – *Glaucomys sabrinus*  
Botta's Pocket Gopher – *Thomomys bottae*  
Western Harvest Mouse – *Reithrodontomys megalotis*  
California Mouse – *Peromyscus californicus*  
Deer Mouse – *Peromyscus maniculatus*  
Brush Mouse – *Peromyscus boylii*  
Dusky-footed Woodrat – *Neotoma fuscipes*  
Montane Vole – *Microtus montanus*  
Long-tailed Vole – *Microtus longicaudus*  
Western Jumping Mouse – *Zapus princeps*  
Porcupine – *Erethizon dorsatum* (uncommon)  
Coyote – *Canis latrans*  
Gray Fox – *Urocyon cinereoargenteus*  
Black Bear – *Ursus americanus*  
Raccoon – *Procyon lotor*  
Marten – *Martes americana*  
Fisher – *Martes pennanti*  
Long-tailed Weasel – *Mustela frenata*  
Badger – *Taxidea taxus*  
Striped Skunk – *Mephitis mephitis*  
Mountain Lion – *Felis concolor*  
Bobcat – *Felis rufus*  
Mule Deer – *Odocoileus hemionus*

## Wildlife Species List

### Amphibians and Reptiles

California Newt – *Taricha torosa*  
Ensatina – *Ensatina eschscholtzi*  
Relictual Slender Salamander – *Batrachoseps relictus*  
Western Toad – *Bufo boreas*  
Pacific Treefrog – *Hyla regilla*  
Foothill Yellow-legged Frog – *Rana boylei*  
Mountain Yellow-legged Frog – *Rana muscosa*  
Bullfrog – *Rana catesbeiana*  
Western Pond Turtle – *Clemmys marmorata*  
Western Fence Lizard – *Sceloporus occidentalis*  
Sagebrush Lizard – *Sceloporus graciosus*  
Gilbert's Skink – *Eumeces gilberti*  
Western Whiptail – *Cnemidophorus tigris*  
Southern Alligator Lizard – *Gerrhonotus multicarinatus*  
Northern Alligator Lizard – *Gerrhonotus coeruleus*  
Rubber Boa – *Charina bottae*  
Sharp-tailed Snake – *Contia tenuis*  
Racer – *Coluber constrictor*  
Striped Racer – *Masticophis lateralis*  
Gopher Snake – *Pituophis melanoleucus*  
Common Kingsnake – *Lampropeltis getulus*  
California Mountain Kingsnake – *Lampropeltis zonata*  
Western Terrestrial Garter Snake – *Thamnophis elegans*  
Western Aquatic Garter Snake – *Thamnophis couchi*  
Night Snake – *Hypsiglena torquata*  
Western Rattlesnake – *Crotalus viridis*  
Ringneck Snake – *Diadophis punctatus*

## Wildlife Species List

### Birds (Aquatic Habitat) – Ponds, streams, meadows

Eared Grebe – *Podiceps nigricollis*  
Western Grebe – *Aechmophorus occidentalis*  
Pied-billed Grebe – *Podilymbus podiceps*  
Great Blue Heron – *Ardea herodias*  
Canada Goose – *Branta Canadensis*  
Mallard – *Anas platyrhynchos*  
Pintail – *Anas acuta*  
Green-winged Teal – *Anas crecca*  
Cinnamon Teal – *Anas cyanoptera*  
Northern Shoveler – *Anas clypeata*  
Wood Duck – *Aix sponsa*  
Ring-necked Duck – *Aythya collaris*  
Bufflehead – *Bucephala albeola*  
Hooded Merganser – *Lophodytes cucullatus*  
Common Merganser – *Mergus merganser*  
Virginia Rail – *Rallus limicola*  
American Coot – *Fulica americana*  
Common Snipe – *Capella gallinago*  
Spotted Sandpiper – *Actitus macularia*  
Wilson's Phalarope – *Steganopus tricolor*  
California Gull – *Larus californicus*  
Ring-billed Gull – *Larus delawarensis*  
Belted Kingfisher – *Megaceryle alcyon*  
Dipper – *Cinclus mexicanus*  
Long-billed Marsh Wren – *Cistothorus palustris*

## Wildlife Species List

### Birds

Turkey Vulture – *Cathartes aura*  
Goshawk – *Accipiter gentilis*  
Sharp-shinned Hawk – *Accipiter striatus*  
Cooper's Hawk – *Accipiter cooperi*  
Red-tailed Hawk – *Buteo jamaicensus*  
Swainson's Hawk – *Buteo swainsoni*  
Golden Eagle – *Aquila chrysaetos*  
Marsh Hawk – *Circus cyaneus*  
Merlin – *Falco columbarius*  
American Kestrel – *Falco sparverius*  
Blue Grouse – *Dendragapus obscurus*  
Mountain Quail – *Oreortyx pictus*  
Killdeer – *Charadrius vociferus*  
Band-tailed Pigeon – *Columba fasciata*  
Mourning Dove – *Zenaida macroura*  
Flammulated Owl – *Otus flammeolus*  
Great Horned Owl – *Bubo virginianus*  
Pygmy Owl – *Glaucidium gnoma*  
Spotted Owl – *Strix occidentalis*  
Saw-whet Owl – *Aegolius acadicus*  
Poor-will – *Phalaenopilus nuttallii*  
Common Nighthawk – *Chordeiles minor*  
Black Swift – *Cypseloides niger*  
Vaux's Swift – *Cheatura vauxi*

## Wildlife Species List

### Birds

White-throated Swift – *Aeronautes saxatalis*  
Black-chinned Hummingbird – *Archilochus alexandri*  
Anna’s Hummingbird – *Calypte anna*  
Allen’s Hummingbird – *Selasphorus sasin*  
Rufous Hummingbird – *Selasphorus rufus*  
Calliope Hummingbird – *Stellula calliope*  
Common Flicker – *Colaptes auratus*  
Pileated Woodpecker – *Dryocopus pileatus*  
Acord Woodpecker – *Melanerpes formicivorous*  
Lewis’ Woodpecker – *Melanerpes lewis*  
Yellow-bellied Sapsucker – *Sphyrapicus varius*  
Williamson’s Sapsucker – *Sphyrapicus thyroideus*  
Hairy Woodpecker – *Picoides villosus*  
Downy Woodpecker – *Picoides pubescens*  
Nuttall’s Woodpecker – *Picoides nuttallii*  
White-headed Woodpecker – *Picoides albolarvatus*  
Black-backed Three-toes Woodpecker – *Picoides arcticus*  
Ash-throated Flycatcher – *Myiarchus cinerascens*  
Willow Flycatcher – *Empidonax traillii*  
Hammond’s Flycatcher – *Empidonax hammondii*  
Dusky Flycatcher – *Empidonax obertholseri*  
Western Flycatcher – *Empidonax difficilis*  
Western Wood Pewee – *Contopus sordidulus*  
Olive-sided Flycatcher – *Nuttallornis borealis*  
Violet-green Swallow – *Tachycieneta thalassina*  
Tree Swallow – *Iridoprocne bicolor*

## Wildlife Species List

### Birds

Rough-winged Swallow – *Stelgidopteryx ruficollis*  
Barn Swallow – *Hirundo rustica*  
Cliff Swallow – *Petrochelidon pyrrhonota*  
Steller's Jay – *Cyanocitta stelleri*  
Common Raven – *Corvus corax*  
Piñon Jay – *Gymnorhinus cyanocephalus*  
Common Crow – *Corvus brachyrhynchos*  
Mountain Chickadee – *Parus gambeli*  
Bushtit – *Psaltriparus minimus*  
White-breasted Nuthatch – *Sitta carolinensis*  
Red-breasted Nuthatch – *Sitta Canadensis*  
Pygmy Nuthatch – *Sitta pygmaea*  
Brown Creeper – *Certhia familiaris*  
Wrenit – *Chamaea fasciata*  
Winter Wren – *Troglodytes troglodytes*  
House Wren – *Troglodytes aedon*  
Bewick's Wren – *Thryomanes bewickii*  
Cañon Wren – *Catherpes mexicanus*  
Rock Wren – *Salpinctes obsoletus*  
American Robin – *Turdus migratorius*  
Varied Thrush – *Ixoreus naevius*  
Hermit Thrush – *Catharus guttata*  
Swainson's Thrush – *Catharus ustulata*  
Western Bluebird – *Sialia mexicana*  
Mountain Bluebird – *Sialia currucoides*

## Wildlife Species List

### Birds

Ruby-crowned Kinglet – *Regulus calendula*  
Townsend's Solitaire – *Myadestes townsendi*  
Blue-gray Gnatcatcher – *Polioptila caerulea*  
Golden-crowned Kinglet – *Regulus satrapa*  
Water Pipit – *Anthus spinoletta*  
Cedar Waxwing – *Bombycilla cedrorum*  
Phainopepla – *Phainopepla nitens*  
Hutton's Vireo – *Vireo huttoni*  
Solitary Vireo – *Vireo solitarius*  
Warbling Vireo – *Vireo gilvus*  
Orange – crowned Warbler – *Vermivora celata*  
Nashville Warbler – *Vermivora ruficapilla*  
Yellow Warbler – *Dendroica petechia*  
Yellow-rumped Warbler – *Dendroica coronata*  
Black-throated Gray Warbler - *Dendroica nigrescens*  
Townsend's Warbler – *Dendroica townsendi*  
Hermit Warbler – *Dendroica occidentalis*  
MacGillivray's Warbler – *Oporornis tolmiei*  
Common Yellowthroat – *Geothlypis trichas*  
Wilson's Warbler – *Wilsonia pusilla*  
House Sparrow – *Passer domesticus*  
Western Meadowlark – *Sturnella neglecta*  
Red-winged Blackbird – *Agelaius phoeniceus*  
Northern Oriole – *Icterus galbula*  
Brewer's Blackbird – *Euphagus cyanocephalus*

## Wildlife Species List

### Birds

Brown-headed Cowbird – *Molothrus ater*  
Western Tanager – *Piranga ludoviciana*  
Black-headed Grosbeak – *Pheucticus melanocephalus*  
Lazuli Bunting – *Passerina amoena*  
Evening Grosbeak - *Hesperiphona vespertina*  
Purple Finch – *Carpodacus purpureus*  
Cassin's Finch – *Carpodacus cassinii*  
Pine Siskin – *Carduelis pinus*  
Lesser Goldfinch – *Carduelis psaltria*  
Red Crossbill – *Loxia curvirostra*  
Green-tailed Towhee – *Pipilo chlorurus*  
Rufous-sided Towhee – *Pipilo erythrophthalmus*  
Lark Sparrow – *Chondestes grammacus*  
Dark-eyed Junco – *Junco hyemalis*  
Chipping Sparrow – *Spizella passerina*  
Brewer's Sparrow – *Spizella breweri*  
Black-chinned Sparrow – *Spizella atrogularis*  
White-crowned Sparrow – *Zonotrichia leucophrys*  
Golden-crowned Sparrow – *Zonotrichia atricapilla*  
Fox Sparrow – *Passerella iliaca*  
Lincoln's Sparrow – *Melospiza lincolnii*  
Song Sparrow – *Melospiza melodia*

PROCEDURES FOR AVOIDANCE OF EFFECTS TO CULTURAL RESOURCES  
ON STATE FOREST TIMBER SALES

1. Archeological sites should be removed from timber harvest consideration, however, selective harvesting may be permitted within the boundaries of archeological sites if:
  - a. It can be accomplished without damage to any recorded feature
  - b. Adverse effects to surface artifacts can be avoided by appropriate procedures (such as mapping, collection, and curation)
  - c. No subsurface damage is expected (such as due to an absence of a subsurface cultural deposit or use of longlining on skyline yarding)
2. Any trees previously marked for harvesting within the boundaries of an archeological site will have that mark cancelled or removed prior to the start of the timber sale if necessary to protect the site.
3. No equipment or vehicular passage over or through an archeological site will be permitted.
4. Trees with historic blazes, carvings, K-tags, or cat-faces useful for studying the fire history shall be evaluated for their historic value prior to removal. Non-native trees associated with significant historic sites will be left if necessary to maintain site integrity.
5. Logs may be skidded across historic railroad grades providing that:
  - a. Significant associated features (such as trestle remnants, inclines, tunnels, structures, or camps) are avoided.
  - b. The number of points where the grade is crossed is kept to a minimum and that the course of the grade is still recognizable at the completion of the operations.
6. No skid trails, skid roads, temporary roads, road widening, road construction, landings, yarding areas, or other such ground disturbance activities shall be allowed within an archeological site.
7. If logging or other forestry operations are planned in proximity to an archeological site, the site boundaries will be flagged or posted to prevent equipment from straying onto the site. This flagging shall be done in consultation with the CDF Archeologist.
8. All flags and signs indicating site boundaries shall be removed following completion of operations.
9. If the operations are a sufficient distance away from the archeological site, or if the archeological site is protected by any natural barriers so that identification of the site boundaries is not necessary, no flagging or marking will be done.
10. The Timber Sale Officer or project supervisor shall be aware of the presence and location of all known archeological sites within the project area, and will insure the protection of these resources by periodic inspection.
11. Any evidence of recent or ongoing vandalism (including but not limited to surface collecting, actual digging, bottle collecting, rummaging through dumps, removing early mining equipment or portions of cabins, etc.) shall be promptly reported to the Forest Manager and the CDF Archeologist.
12. If any damage is caused by logging activities, such as skidding a log through an archeological site, the Forest Manager and the CDF Archeologist shall be informed immediately.

Appendix C-1

13. The Sale Officer will inspect all identified archeological sites at the conclusion of the timber sale and report any damage to the CDF Archeologist.
14. If any previously unidentified archeological sites are discovered or exposed during timber harvesting activities, operations shall be suspended in the immediate area and the CDF Archeologist shall be notified so that the site can be recorded and the appropriate mitigation determined.

Appendix C-2





## Appendix D-1

### Mountain Home Demonstration State Forest Road Inventory

#### Main Seasonal Roads

Camp Lena Road: Balch Park Rd. Jct. To Pack Station .....	0.61 Miles
Frasier Mill Campground A Loop.....	0.06 Miles
Frasier Mill Campground B Loop.....	0.23 Miles
Frasier Mill Campground C Loop .....	0.01 Miles
Frasier Mill Campground D Loop .....	0.45 Miles
Frasier Mill Campground E Loop.....	0.23 Miles
Headquarters Driveway: Bear Creek Rd. to End.....	0.29 Miles
Hedrick Pond Campground Road .....	0.10 Miles
Hedrick Spring Road: Bear Creek Rd. to End .....	0.30 Miles
Methuselah Campground Road .....	0.40 Miles
Moses Gulch Road: River Rd. to Moses Gulch Rd. ....	1.19 Miles
Moses 1-5.....	0.13 Miles
Old Mountain Home Picnic Area .....	0.04 Miles
River Road: Summit Rd. Jct. to Hidden Falls .....	2.54 Miles
Shake Camp Road: Pack Station to Campground .....	0.77 Miles
Summit Road: Balch Park Rd. Jct. to Pack Station .....	2.61 Miles

#### Spur Seasonal Roads

Bear Creek Spur: Old Bear Creek Rd. to Powerline Landing.....	0.33 Miles
Bogus Meadow Road: Camp Lena Rd. to End.....	0.58 Miles
California Stump Road: Camp Lena Rd. to End.....	0.25 Miles
Coburn Mill Road: Headquarters Driveway to Old Bear Creek Rd.....	0.97 Miles
Copper Mine Road: River Rd. to Forest Boundary.....	1.41 Miles
Copper Mine Spur: Copper Mine Rd. to End.....	0.29 Miles
Dogwood Meadow Road: Summit Rd. (lower) to Summit Rd.....	1.04 Miles
Dome Rock Road: Forest Boundary to Dome Rock.....	0.57 Miles
East Balch Spur: Summit Rd. to End .....	0.22 Miles
East Dogwood Meadow Spur: Dogwood Meadow Rd. to End .....	0.29 Miles
Frasier D Loop Spur .....	0.20 Miles
Frasier Mill Water System Road: Camp Lena Rd. to End .....	0.23 Miles
Galena Creek Road: McAnlis Rd. to End .....	1.90 Miles
Garbage Bin Road: Methuselah Campground Rd. to End .....	0.09 Miles
Helicopter Landing Spur: Galena Creek Rd. to End.....	0.05 Miles
Jacks Road: River Rd. to Moses Gulch Rd. ....	1.11 Miles
Lace Meadow Road: Summit Rd. to Bear Creek Rd.....	1.03 Miles
Lindley Road: Old Frasier Grade to Forest Boundary .....	0.58 Miles
McAnlis Road: Hidden Falls to McAnlis Trail.....	1.12 Miles
McAnlis Middle Spur: McAnlis Rd. to End .....	0.52 Miles
Miller Road: Tub Flats Rd. to End .....	0.22 Miles
Mosquito Pond Road: Camp Lena Rd. to California Stump Rd.....	0.18 Miles
North Balch Road: Bear Creek Rd. to End.....	0.71 Miles
Old Bear Creek Road: Headquarters Driveway to Forest Boundary .....	0.36 Miles
Old Frasier Grade: Section 34 Rd. to Forest Boundary .....	0.22 Miles

## II. Appendix D-1

Powderhouse Road: Bear Creek Rd. to Headquarters .....	0.72 Miles
Powerline Road: Bear Creek Rd. to End (0.30 Mile) .....	0.30 Miles
Rock Crusher Road: Summit Rd. to End .....	0.33 Miles
Section 34 Road: Balch Park Rd. to Breckenridge Gate .....	1.39 Miles
Shake Water Tank Road: Campground to End .....	0.16 Miles
Swedish Tree Road: Dogwood Meadow Rd. to End .....	0.19 Miles
Transplant Bed Spur: Powderhouse Rd. to End .....	0.10 Miles
Tub Flats Road: Camp Lena Rd. to End .....	1.01 Miles
Upper Moses Gulch Road: River Rd. to End .....	0.52 Miles
Upper Moses Gulch Spur: Upper Moses Gulch Rd. to End .....	0.06 Miles
Vantage Point Road: Summit Rd. to End .....	0.48 Miles
West Dogwood Spur .....	0.06 Miles

### Temporary Roads

Dome Rock Spur: Dome Rock Rd. to End .....	0.50 Miles
Hidden Falls Spring Spur: McAnlis Rd. to End .....	0.31 Miles
Japan Tree Road: Dogwood Meadow Rd. to End .....	0.50 Miles
Loop Trail Road: Shake Water Tank Rd. to End .....	0.18 Miles
Upper Lace Spur: Summit Rd. to End .....	0.10 Miles
West Summit Spur: Summit Rd. to End .....	0.16 Miles

### Roads to be Closed

Frasier Mill Water System Road: Camp Lena Rd. to End .....	0.23 Miles
Garbage Bin Road: Methuselah Campground Rd. to End .....	0.09 Miles
Hammer Valley Road: Camp Lena Rd. to Frasier Mill D Loop .....	0.02 Miles
Living Dead Tree Road: Summit Rd. to End .....	0.17 Miles
Powerline Road: 0.30 Mile to 0.63 Mile .....	0.33 Miles

MAPS

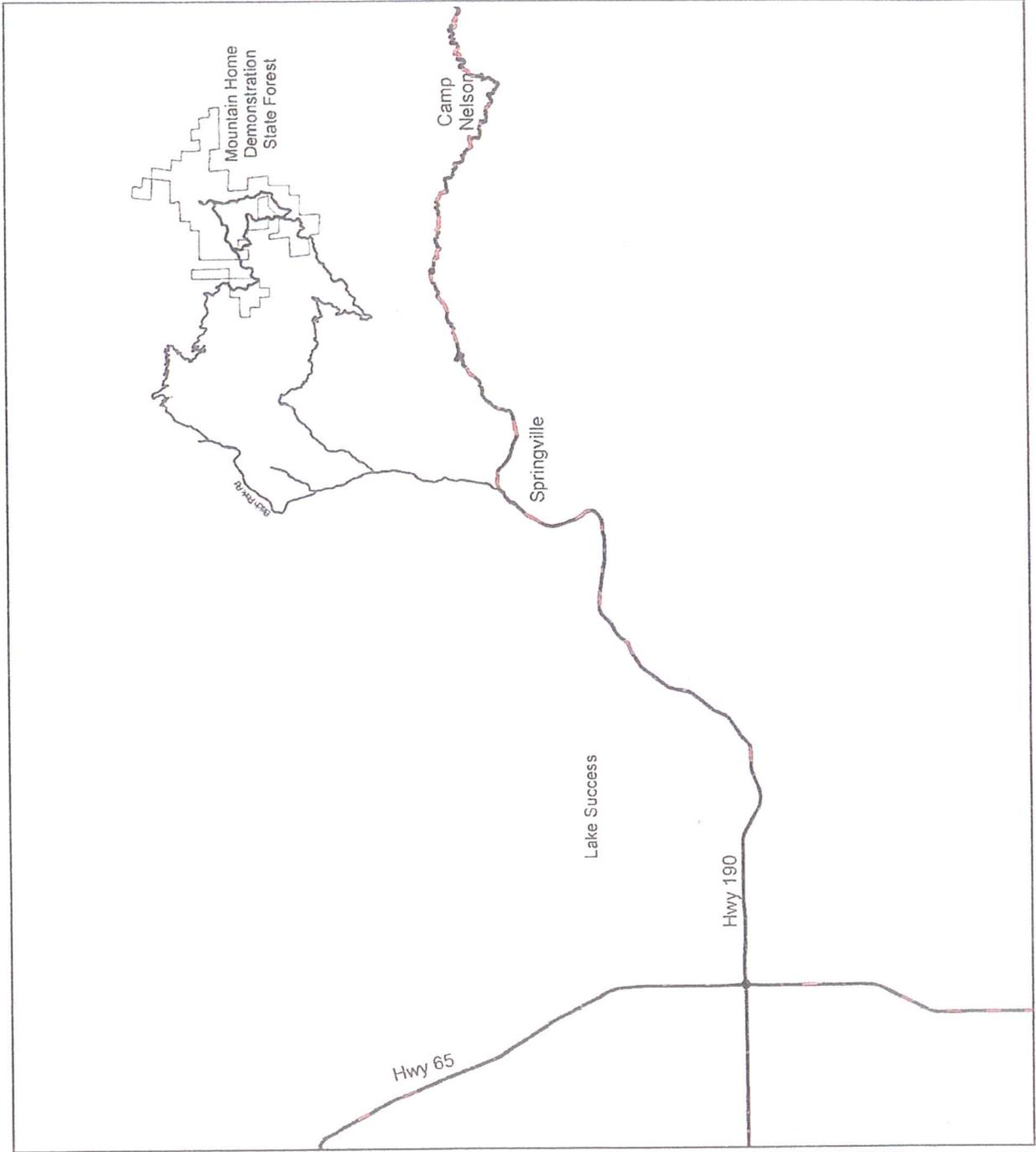


# Mountain Home Demonstration State Forest Location Map



## Legend

- Highways
- County Roads
- Forest Boundary





# Mountain Home Demonstration State Forest Boundary Map

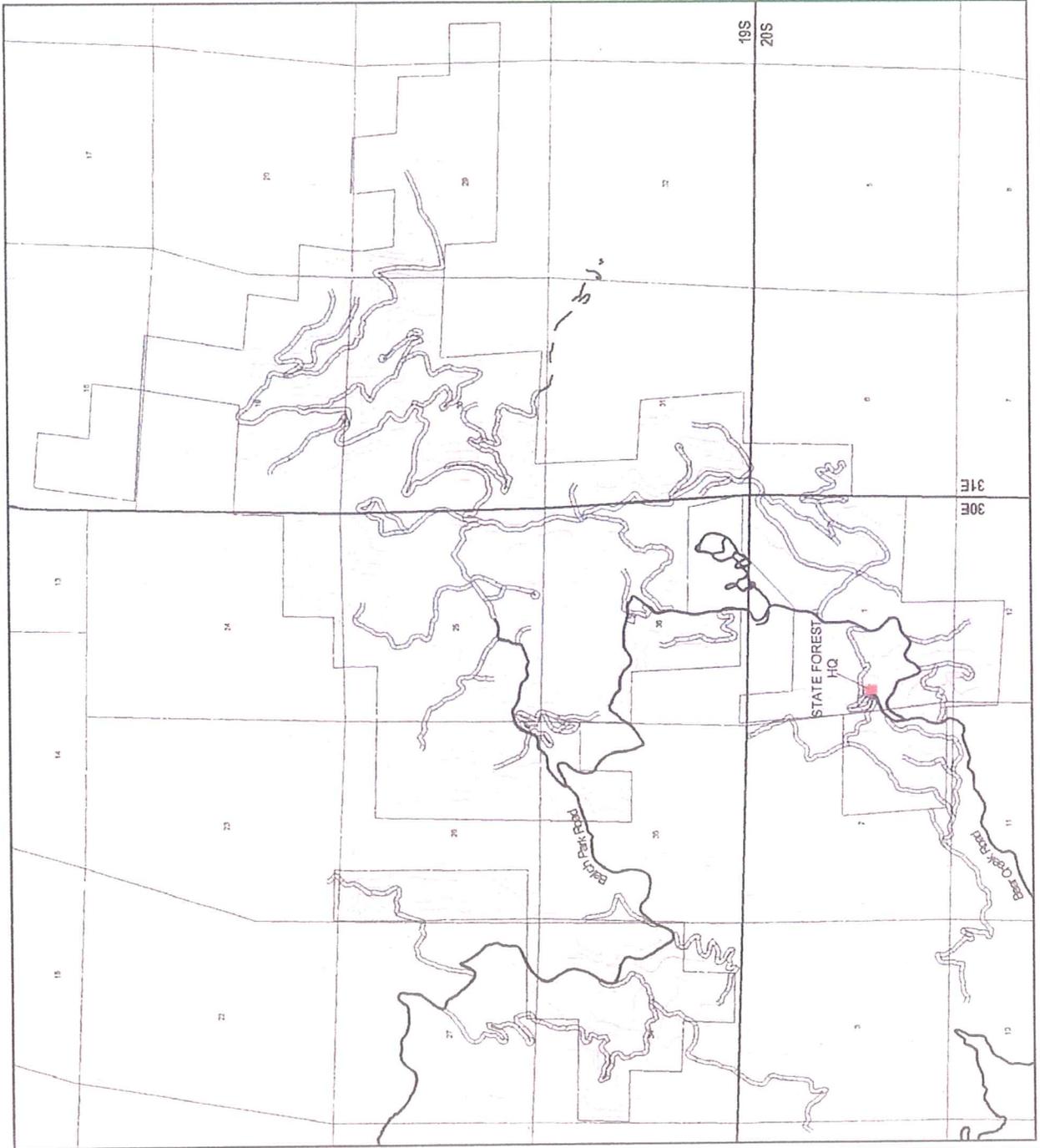


## Legend

-  State Forest HQ
-  County Roads
-  Main Seasonal Roads
-  Spur Seasonal Roads
-  4-WD Roads
-  Forest Boundary



Contour Interval: 100 ft  
 1:48000  
 0 1 Miles



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Appendix - E2



# Mountain Home Demonstration State Forest Roads Map

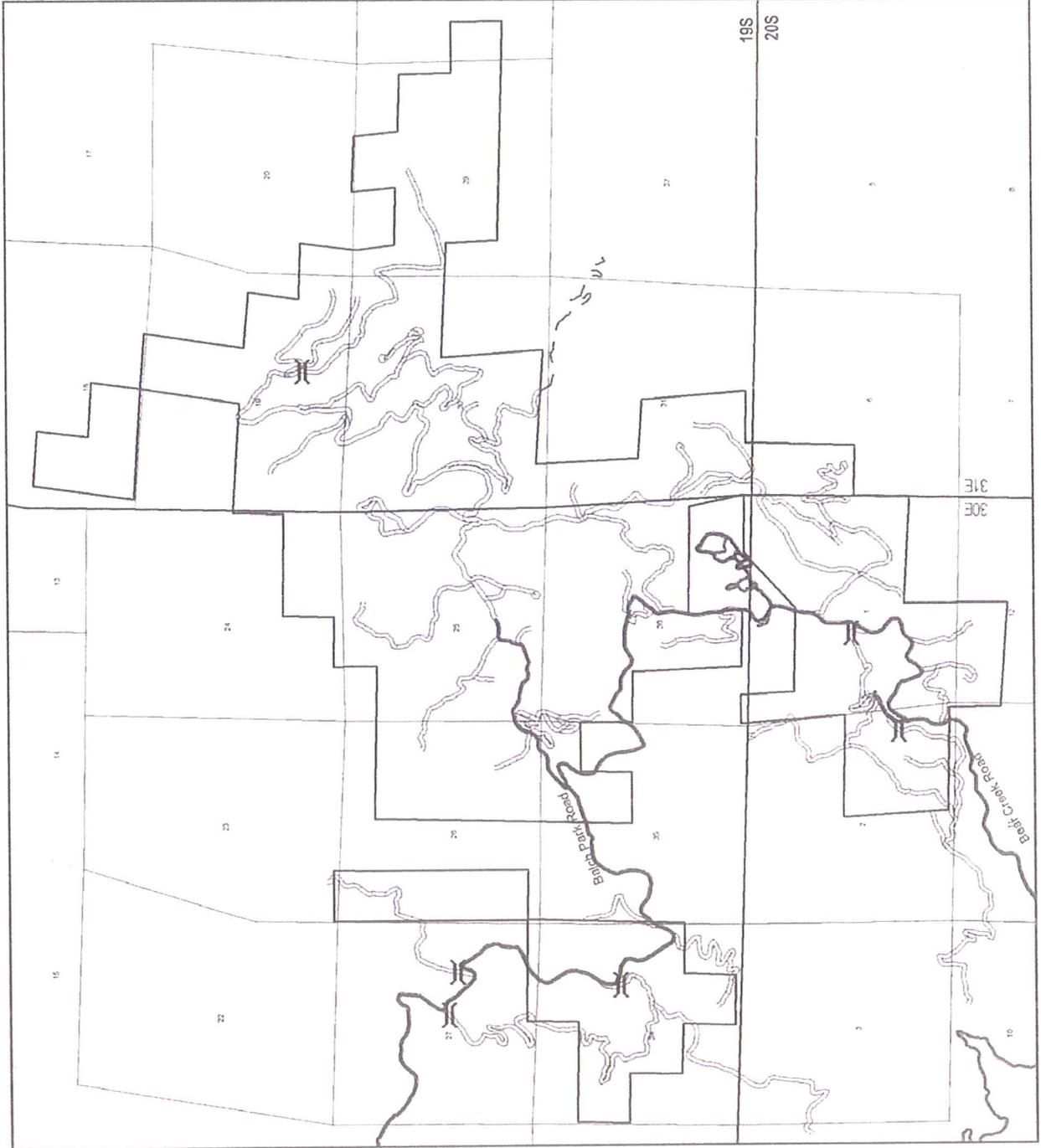


**Legend**

- County Roads
- Main Seasonal Roads
- - - Spur Seasonal Roads
- - - 4-WD Road
- ( ) Locked Gates
- Forest Boundary

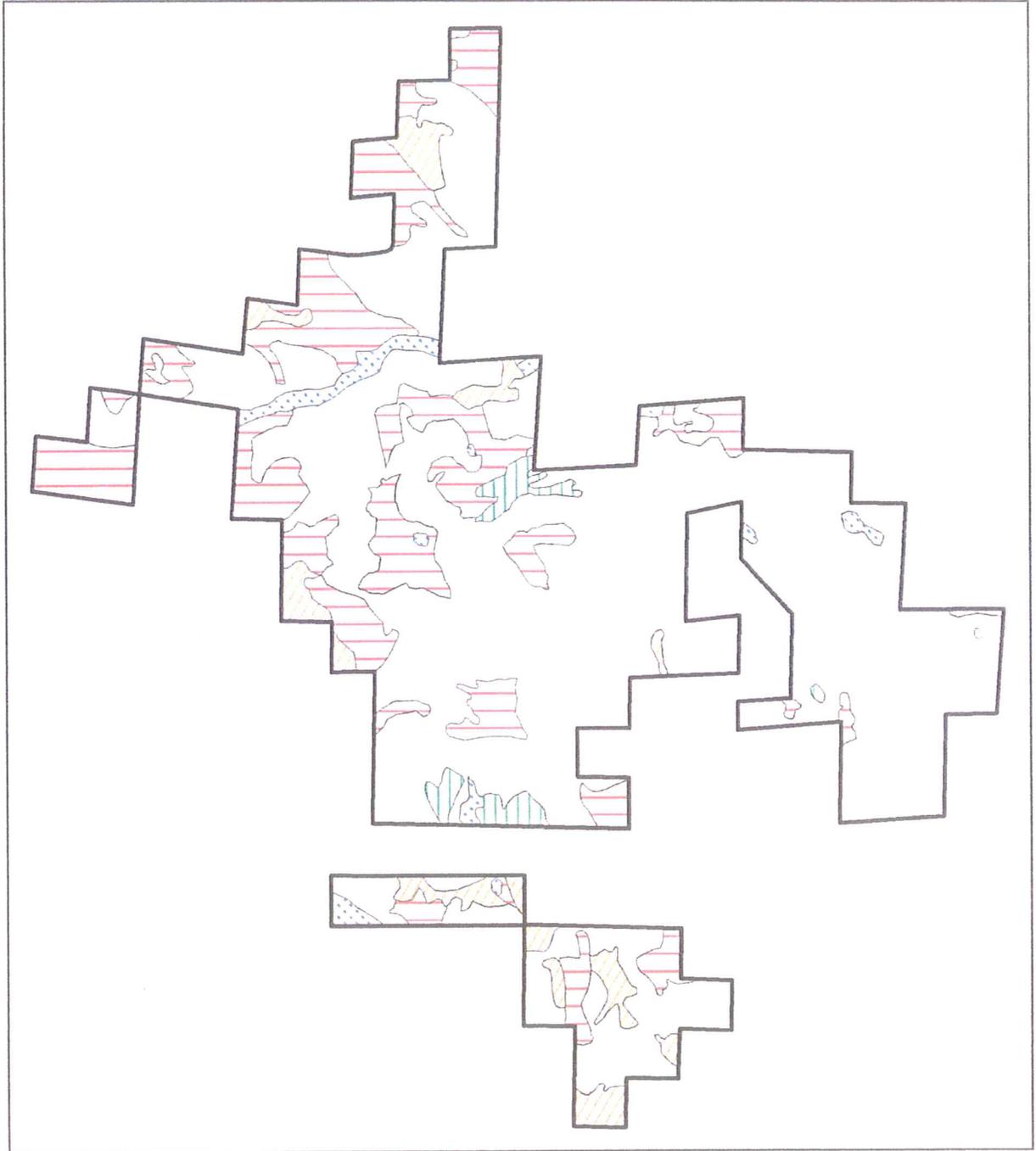


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# Mountain Home Demonstration State Forest Site Classes Map



## Legend

- Site Classes
- Site 1 
  - Site 2 
  - Site 3 
  - Site 4 
  - Site 5 



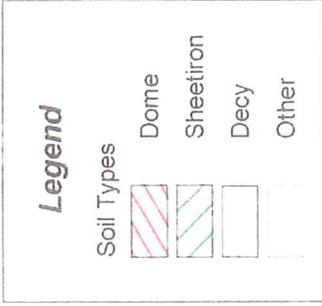
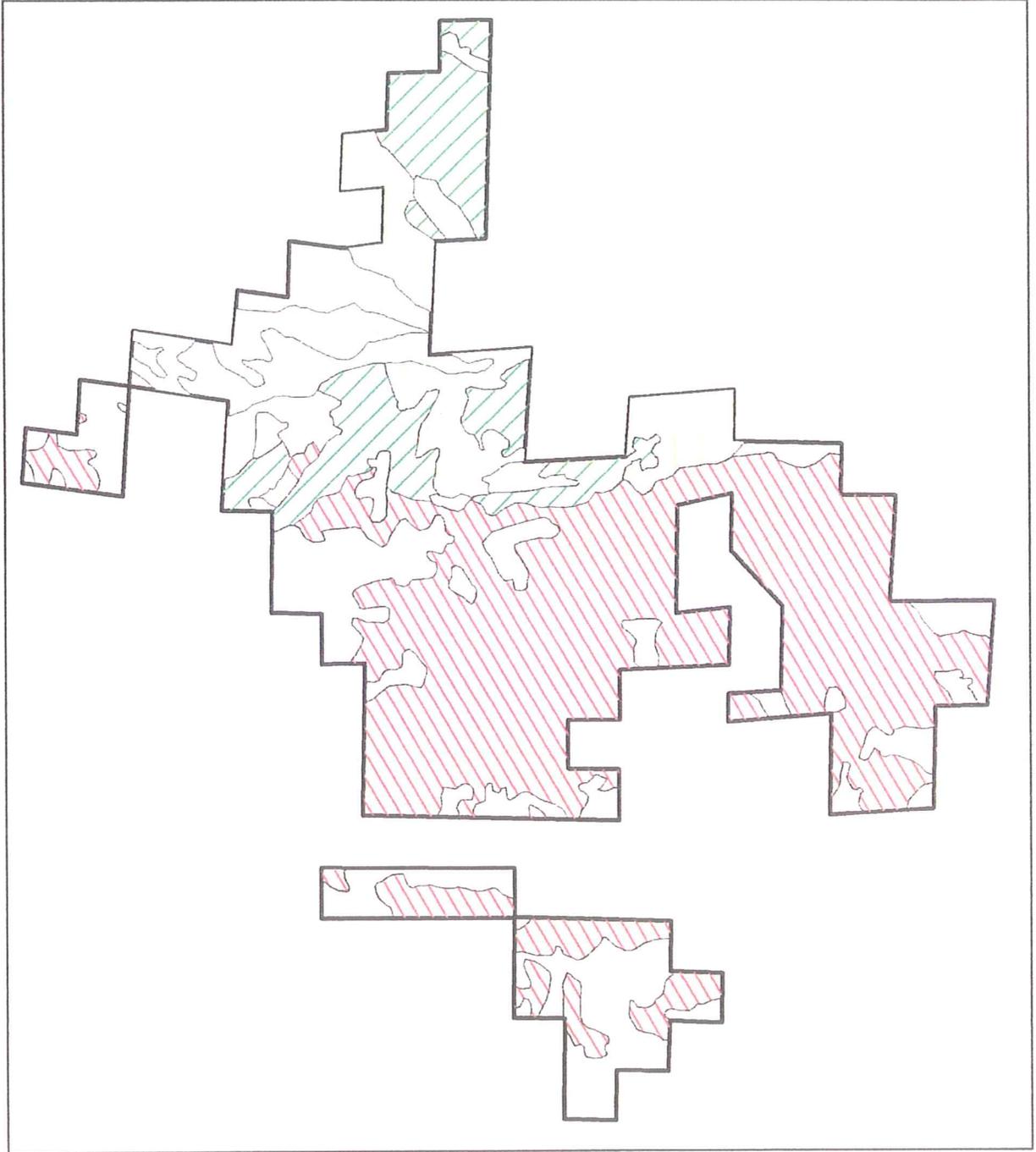
1:48000  
0 1 Miles

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Appendix - E4



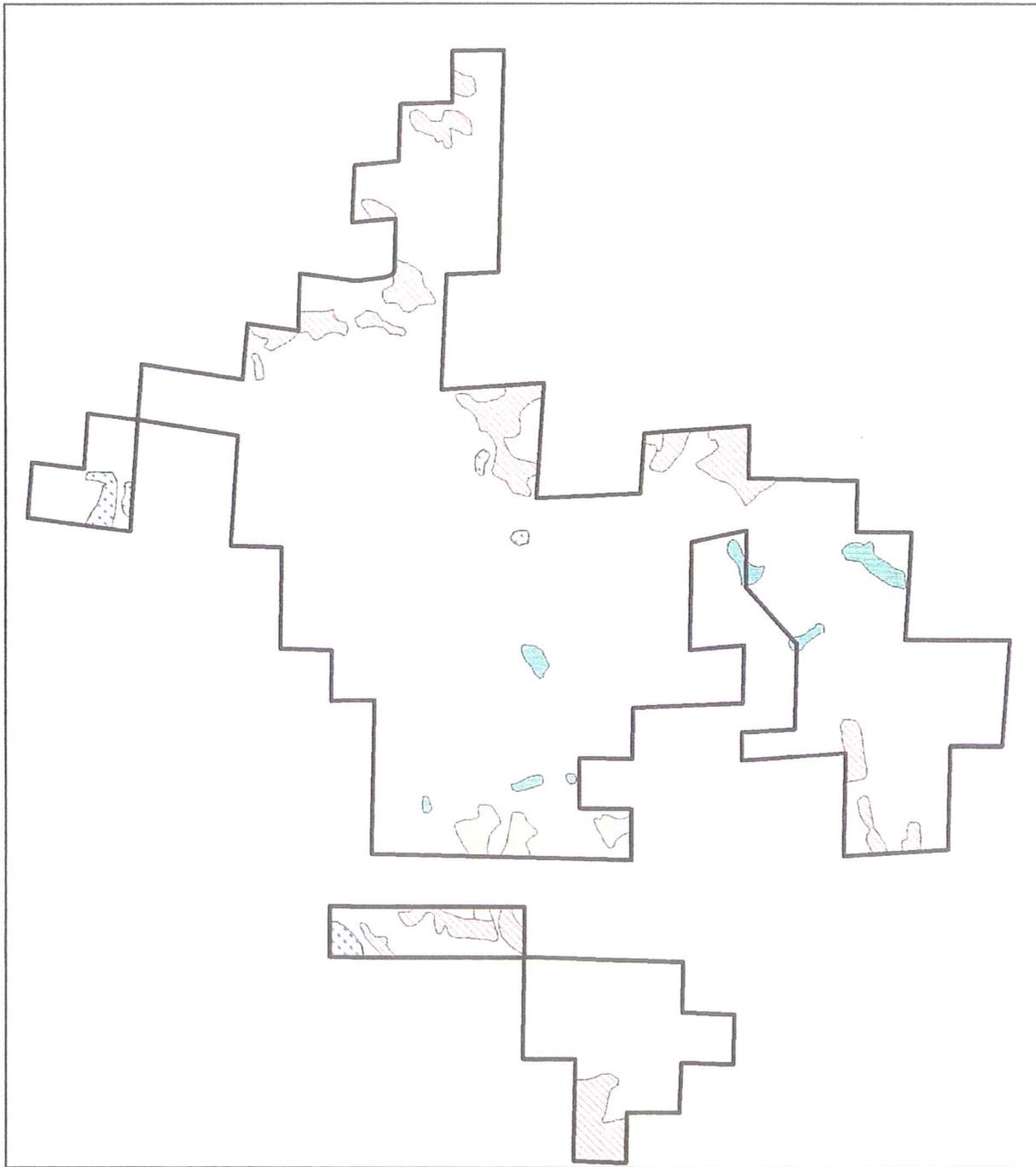
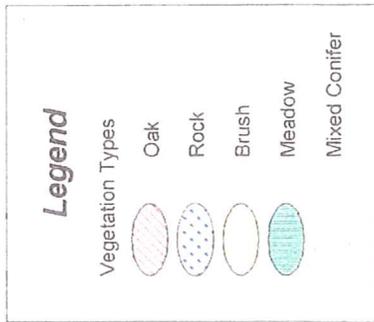
# Mountain Home Demonstration State Forest Soils Series Map



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# Mountain Home Demonstration State Forest Vegetation Types Map



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# Mountain Home Demonstration State Forest Trails Map

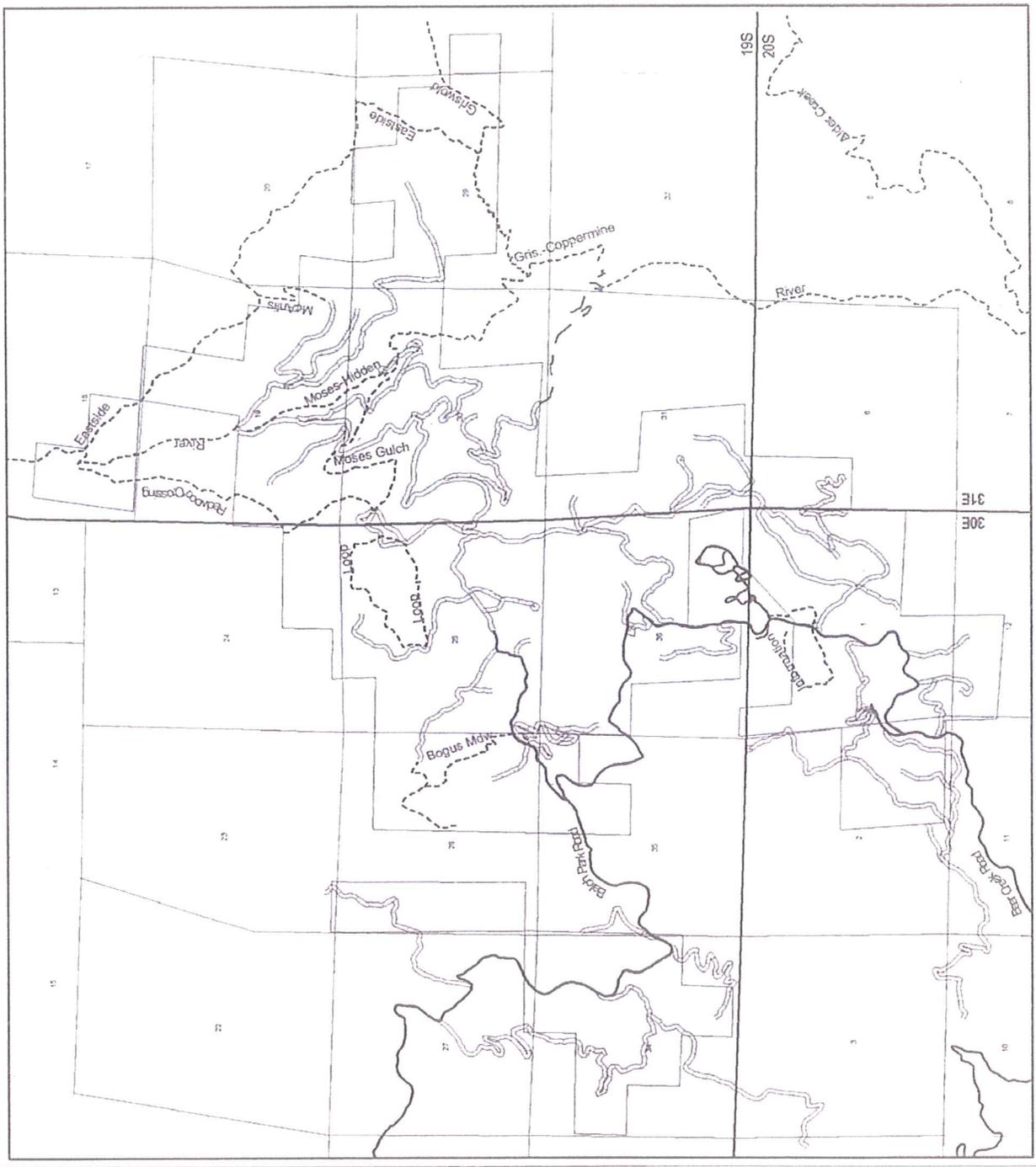


**Legend**

- County Roads
- Main Seasonal Roads
- Spur Seasonal Roads
- 4-WD Roads
- Trails
- Forest Boundary

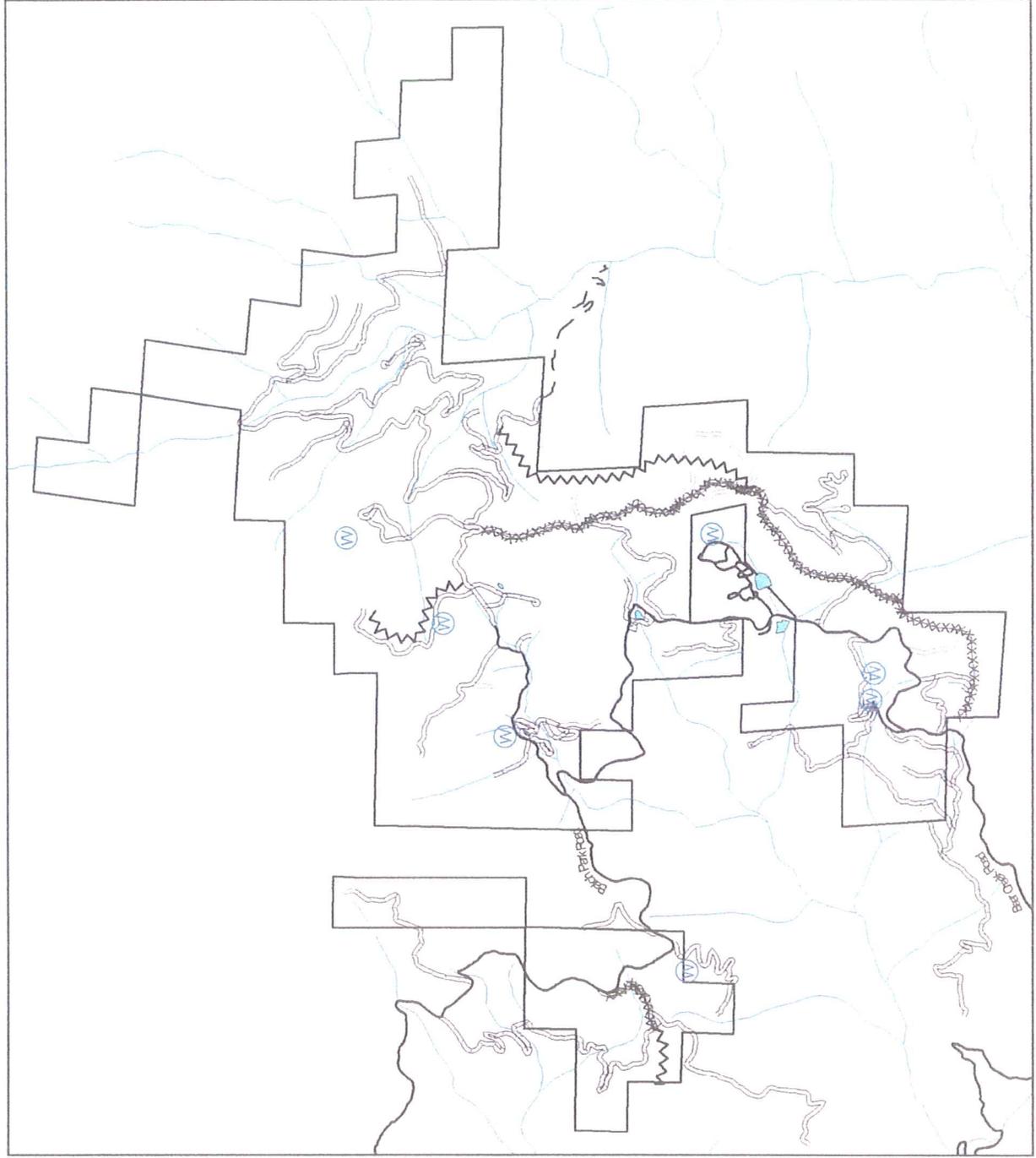


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# Mountain Home Demonstration State Forest Fire Defenses Map



**Legend**

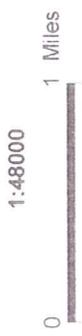
- County Roads
- Main Seasonal Roads
- Spur Seasonal Roads
- 4-WD Roads

**Fuel Breaks**

- Existing Fuel Break (xxxxxxx)
- Proposed Fuel Break (zzzzzzz)

**Water Source**

- Water Tank (W in circle)
- Ponds (blue oval)
- Creeks (blue line)
- Forest Boundary (thick black line)



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# Mountain Home Demonstration State Forest Recreation Sites Map



## Legend

- County Roads
- Main Seasonal Roads
- Spur Seasonal Roads
- 4-WD Roads
- Proposed Campground
- Existing Campground
- Picnic Areas
- Buildings
- Pack Station
- Forest Boundary



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Appendix - E9

