

# **Jackson Demonstration State Forest**

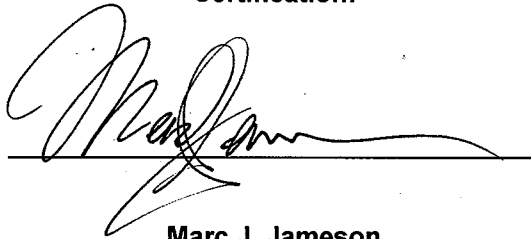
**Plan for achievement of**

## **Maximum Sustained Production of High Quality Timber Products**

**in accordance with**

**Title 14 CCR 913.11(a)**

**Certification:**

A handwritten signature in black ink, appearing to read 'Marc J. Jameson', is written over a solid horizontal line. The signature is fluid and cursive.

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# Table of Contents

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<b>CHAPTER 1. BACKGROUND</b> .....	4
Purpose of Document .....	4
Objectives .....	4
Description of Jackson Demonstration State Forest .....	5
History of Jackson Demonstration State Forest .....	7
<b>CHAPTER 2. EXISTING FOREST CONDITIONS</b> .....	9
Current Forest Management .....	9
Forest Structure.....	9
Resource Inventories.....	10
Timber Sale Program.....	11
Recreation.....	11
Road Management.....	12
Minor Forest Products.....	12
Research and Demonstration.....	13
Vegetation and Site Class.....	14
Stocking.....	15
<b>CHAPTER 3. PLANNED FUTURE CONDITIONS</b> .....	16
Desired Future Forest Structure Conditions.....	16
Forest Management.....	17
Initial Implementation Period and Short Term Harvest Schedule.....	22
Limits on Timber Productivity Imposed by Other Forest Values .....	26
Special Concern Areas.....	26
Watersheds.....	28
Water Quality.....	29
Wildlife, Fisheries and Plants.....	30
Recreation.....	33
Regional Economic Vitality.....	34
Aesthetic Enjoyment.....	36
Long Term Sustained Yield.....	37
<b>CHAPTER 4. DATA AND METHODS</b> .....	39
Land Types .....	39
Vegetation Coverage .....	39
Site .....	39
Resource Inventories .....	40
Silvicultural Prescriptions .....	40
Growth and Yield .....	45
<b>References:</b> .....	47
<b>Tables and Charts:</b>	
List of Tables	
1. Planned Distribution of Silvicultural Methods.....	18
2. Short-term Harvest Schedule.....	23

3. Employment and Revenue Effects of Various Timber Harvest Levels.....	36
4. Beginning Vegetation Strata Statistics.....	49
5. Acres by Redwood Site Class.....	50
6. Inventory, Growth, and Harvest Over Time, Conifer.....	50
7. Allocation of Acres by Silvicultural Method.....	50
8. Acres Harvested Each Decade by Silvicultural Method.....	51
9. Conversion of Aggregated JDSF Vegetation to Modeled Vegetation at Time Zero.....	51
10. Modeled Vegetation by Decade.....	54

List of Map Figures (note: oversize maps attached at back of document)

1. JDSF ownership
4. Site Class
5. Forest Management Areas and Special Concern Areas
6. Short Term Harvest Schedule

## Appendixes

1. Tables and Charts.....	49
2. Forest Cover Typing Procedures.....	56
3. Sample Yield Streams.....	59

## **Chapter 1. Background**

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The Z'berg-Nejedly Forest Practices Act authorizes the California Board of Forestry and Fire Protection (Board) to adopt Forest Practice Rules (FPRs) that govern all timber-harvest-related activities on private and non-federal public forestlands in California. In 1994, the Board passed a series of regulations that require timberland owners to demonstrate maximum sustainable production (MSP) of high-quality timber products by either (1) submitting an "Option A" timber harvest plan, (2) preparing a sustained yield plan ("Option B"), or (3) following a set of prescriptive silvicultural requirements ("Option C"). The three options for meeting the MSP requirement are named after Forest Practice Rules sections 913.11 (a), (b), and (c), respectively.

An Option A plan identifies sustainable harvest levels given constraints on timber production from other public trust resources. Although there is no upper limit on the size of the assessment area for an Option A plan, Option A plans are tiered to individual THPs. Consequently an Option A plan, once approved, has no fixed life span. Every THP in the assessment area can conceivably trigger a new review of the Option A plan.

A sustained yield plan is usually a more detailed and formalized landscape-level plan. Documentation requirements are greater than in an Option A plan, and separate watershed and wildlife analyses are required. An SYP, once approved, is valid for 10 years.

Option C requirements consist of a fixed set of prescriptive silvicultural requirements that are deemed to satisfy the MSP requirement in lieu of a formal planning effort. Integral parts of the requirements are maintenance of at least 15 square feet per acre on site I through site III lands or 12 square feet per acre on site IV and site V lands in trees 18-inch (46-cm) diameter-at-breast-height (DBH), and rotation ages of at least 50 years on site I lands, 60 years on site II and III lands, and 80 years on site IV and V lands, in even-aged stands.

Because the California Department of Forestry and Fire Protection (CAL FIRE) manages a total of approximately 75,000 acres of state forestland in California on behalf of the public, the "ownership" exceeds 50,000 acres. CAL FIRE is therefore preparing long-term forest plans for all the State Forests that harvest timber. This document is an Option A plan for the largest State Forest in California, the 48,652-acre Jackson Demonstration State Forest (JDSF).

### **Purpose of Document**

This document is a long-term strategic plan for Jackson Demonstration State Forest that serves two purposes. First, it fulfills the requirements of section 913.11(a) of the California Forest Practice Rules by disclosing sustainable management, a balance of harvest and growth over time, and protection of public trust resources. Second, it meets the Forest's demonstration mandate as an example of an Option A document for a medium- to small-size ownership that strikes a reasonable balance between the competing objectives of cost of preparation and scientific rigor.

### **Objectives**

The objective of the Jackson Demonstration State Forest Option A plan is to project the effect of management on long term sustained yield, as provided by the Jackson Demonstration State Forest Management Plan, prepared by the Department and approved by the State Board of Forestry in January of 2008.

JDSF's management direction derives directly from statutes, regulations, and policies set by the State Board of Forestry and Fire Protection. Board policy describes Jackson and three of the other Demonstration State Forests as "commercial timberland areas managed by professional foresters who conduct programs in timber management, recreation, demonstration, and investigation in conformance with detailed management plans," (Board Policy 0351.1). More specifically, Board policy states that the primary purpose of JDSF is to conduct innovative demonstrations, experiments, and education in forest management; that timber production will be the primary land use on JDSF, and that recreation is recognized as a secondary but compatible land use on JDSF (Board Policy 0351.2).

There is great potential to create a living forest laboratory, available for research and demonstration, by developing and maintaining a broad range of conditions within the Forest. Under the management plan, designated parts of the State

Forest will be managed to produce a high level of forest growth and timber production while maintaining and restoring natural ecological processes, providing opportunities to conduct research and demonstration on the relationship of these goals. The scientific community recognizes that landscape-level patterns are extremely important. Thus, it is critical for the Forest to represent a broad spectrum of conditions, including older forest structure, healthy connected stream systems and associated riparian zones, and a range of habitat and structure conditions in order to meet research and demonstration needs and maintain ecosystem health.

The Department intends to manage JDSF, as well as the rest of the Demonstration State Forest system, as a demonstration of sustainable forest management, as directed by statute and Board policy, which includes production of forest products and protection of values related to recreation, watershed, wildlife, range and forage, fisheries, and aesthetic values. This approach will create and maintain a diverse forest laboratory available for research and demonstration on a vast array of subjects. Informational needs associated with forest management are very large and changing. Clients for research results and demonstration efforts are expanding beyond the traditional clientele group of small and industrial forestland owners to include nonprofit and governmental entities interested in restoration of a wide range of forest resources. Research on JDSF should include applied research on a variety of topics, as well as basic research in such areas ecological and biological forest processes.

The JDSF Management Plan establishes Desired Future Conditions or targets for management. The central goal is not a particular level of timber harvest or a preferred method of harvesting but a set of forest structures that represent the breadth of forest conditions appropriate to direction from statute, Board policy, and Management Plan goals and direction.

Given the current low level of older forest in the redwood region, a significant portion of the structural goals are oriented towards accelerating the development of older forest structures. The plan specifies healthy, functional ecosystems, emulation of natural processes, and broad diversity of forest structures and habitats, while recognizing that humans are an integral part of the ecosystem. Utilizing a diverse set of silvicultural systems is just one of the management tools that may be used to help achieve these Desired Future Conditions. The Plan emphasizes that restoration and maintenance of functioning systems is of high priority. A range of watershed management measures is required to reduce negative inputs to streams (such as fine sediment) and improve positive inputs (such as large woody debris). The Plan includes an aggressive road management plan and includes provisions to develop substantial areas of older forest structure and to recruit large woody debris, snags, and other characteristics of healthy, natural forest ecosystems.

The Management Plan presents a workable approach to create and maintain multiple seral stages, along with important structural habitat elements. It preserves all existing old-growth groves, augmenting most of them to provide large, contiguous areas of older forest habitat. It provides for recruitment of late seral habitat in the Mendocino Woodlands Special Treatment Area, upper Russian Gulch, and lower Big River, as well as along all Class I and II streams. It also provides for a broad corridor of forest with the structural characteristics of older forest that extends from the west to the east and the north to the south. The Plan protects individual large old-growth trees and smaller residual old-growth trees with unique habitat attributes. And it sets goals for increased retention of structural habitat elements such as snags, downed logs, and large green trees and their associated biodiversity values.

Planned harvest actions are set to achieve desired forest structural conditions, not simply to cut current growth or generate revenues. Careful application of silvicultural systems over space and time will achieve these conditions while also ensuring high growth rates and accumulation of high volumes of timber. Under the Plan, standing timber volumes (or "inventory") will continue to build over time, while providing a significant contribution to the local economy through the harvest and processing of timber. The average annual harvest levels during the next decade are estimated to be about 20-25 million board feet per year, and shall not exceed 35 MMBF per year.

## **Description of Jackson Demonstration State Forest**

### **Location**

Jackson Demonstration State Forest (JDSF) is located a little northward of the geographic center of the redwood region, which stretches 500 miles from Del Norte County through Monterey County. About half the total area of redwood forest is located to the north of JDSF and about half to the south. With 542,000 acres of redwood forest, Mendocino County encompasses more redwood forest area than any other county in California (Fire and Resource Assessment Program 2002).

JDSF includes portions of the Noyo and Big River watersheds, as well as several small watersheds that drain directly to the Pacific Ocean. JDSF covers approximately 48,652 acres in central Mendocino County. It varies from 2½ to 8 miles wide in a north-south direction, and is about 16½ miles long on the east-west axis. Its western boundary is within 1.5 miles of the coast, and the eastern boundary generally lies on the crest of the Mendocino Ridge separating the coastal slopes from the inland valleys, approximately 7 miles west of Willits.

The City of Fort Bragg, where the JDSF headquarters facility is located, is 2 miles north of the western property boundary. The town of Mendocino is located 2 miles west of the southwest corner of JDSF. The town of Willits and the Brooktrails development are located approximately 7 miles to the east. Ukiah, the county seat, is 35 miles southeast of JDSF.

## **Topography and Geology**

JDSF and the surrounding area are located on the coastal side of the Mendocino Coast Range. The State Forest lands extend from gently sloping marine terrace surfaces along the Mendocino coastal plain in the west, to increasingly steep, rugged terrain in the eastern part of JDSF that is along the crest of the Mendocino Coast Range. The geomorphology of the coastal mountains of Mendocino County has been strongly influenced by two on-going processes: tectonic uplift and fluctuations in sea level. The landscape is especially affected during low sea level stands, when the coastline moves farther west. During these events, streams down-cut and form deeply incised valleys with steep-sided inner gorges. Once sea level rises (as at present) and the coastline advances, streams aggrade, the deep coastal valleys partially in-fill and estuaries form at the mouths of larger streams.

In general, the landscape is characterized by moderate to high relief. Slopes are less steep in the western watersheds within the Forest, and are steeper to the east in the watersheds nearer the crest of the Mendocino Coast Range. Elevations range from less than 100 feet within stream valleys along the western edge of JDSF, to a maximum of 2,092 feet in the southeast corner. The area drains directly to the Pacific Ocean. The local stream pattern is reminiscent of a "trellis", where short tributary streams flow into larger streams at roughly right angles. Stream pattern is controlled in part by structural patterns in the bedrock. As is true throughout the Coast Ranges, the predominant structural pattern trends northwesterly. Thus, many of the principal watercourses in the area are oriented in a northwest/southeast direction (South Fork Noyo River, Hare Creek, and Caspar Creek).

The California Geological Survey has mapped landslide features and relative landslide potential for the entire Noyo River watershed and for portions of the Big River watershed occupied by JDSF (Manson, Sowma-Bawcom, and Parker 2001; Short and Spittler 2002a; Short and Spittler 2002b). The areas inside and outside of JDSF are generally similar in the percentage of area covered by the various landslide and mass wasting features. Debris slide slopes, followed by rockslides, are the features covering the greatest amount of area. JDSF has a higher percentage of its area in potential inner gorge than does the area outside of the Forest. This situation is of concern because these potentially unstable areas tend to be directly connected to watercourses and have a high likelihood of delivering sediment to watercourses if they release material due to either natural causes or anthropogenic disturbance.

## **Hydrology**

A USGS stream gauging station has been operated on the Noyo River since 1951. Large runoff events have occurred in 1955, 1964, 1974, 1993, and 2006. Streamflow has been measured in the Caspar Creek basin since water year 1963, with large runoff events documented in 1964, 1966, 1974, 1993, 1999, and 2006. The effects of harvesting and road building on changes in stream flows have been well documented through the work that has been conducted as part of the Caspar Creek watershed study (Ziemer 1998) (see also, <http://www.fs.fed.us/psw/topics/water/caspar/>). This project has been carried out jointly by the USFS and CAL FIRE since 1962.

## **Vegetation - General Forest Habitats**

The forest type dominates the North Coast, Mendocino County, and JDSF. Beyond JDSF to the west there are coastal and aquatic communities. Within JDSF, key forest vegetation types include the Redwood Series, Red Alder Series, Pygmy Cypress Series, and the Bishop Pine Series (Sawyer and Keeler-Wolf 1995, Holland 1986). Other non-forest vegetation communities are limited in area at JDSF and include sphagnum bogs, marshes and grassland.

The Redwood Series is the principal vegetation type found within JDSF, comprising approximately 48,000 acres.

Redwood (*Sequoia sempervirens*) and Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*) trees dominate the Forest. Other conifers present in the Forest include grand fir (*Abies grandis*), western hemlock (*Tsuga heterophylla*), and Bishop pine (*Pinus muricata*). Hardwoods comprise substantial secondary components in this type and are represented principally by tanoak (*Lithocarpus densiflorus* var. *densiflorus*) and madrone (*Arbutus menziesii*). The mixture of species shifts with distance from the coast, history of the area, exposure and soils. Redwood becomes less dominant moving inland with Douglas-fir and hardwood increasing. Some of the inland areas would be classified as Douglas-fir series by Sawyer and Keeler-Wolf (1995), and Holland (1986).

Most of the redwood stands found on JDSF are young (from five to 120 years old), but several small stands of unentered and residual old-growth forest remain, totaling approximately 459 acres. The management history has influenced the species distribution in the eastern part of the forest as well. Though conifers dominate the forest overall, hardwoods play a role at JDSF. Young tanoak and madrone dominate young fir and redwood in some areas, and exist within most conifer stands at the mid and lower canopy levels. Hardwoods are more prevalent toward the central and eastern portions of the Forest.

The riparian Red Alder Series found in the western portion of the Forest can contain relatively pure stands of alder. Alder, Big leaf maple, and willow are generally restricted to riparian areas. Additional hardwoods found on JDSF are: California bay (*Umbellularia californica*), chinquapin (*Chrysolepis chrysophylla* var. *minor*), and canyon live oak (*Quercus chrysolepis*).

The Mendocino pygmy forest is a unique ecological community that occurs only in coastal Mendocino County. The California Natural Diversity Database (CNDDDB) recognizes it as a community that is "rare and worthy of consideration." (2003). The Pygmy Cypress series covers approximately 613 acres of JDSF near the western extent of the Forest. CAL FIRE and California State Parks cooperate to manage some of this area.

Within the Pygmy forest areas there are two Sphagnum bogs. The Pygmy Cypress series often lies adjacent to Bishop Pine series. This type is typically found on soils that lack the fertility to support timber and often have pygmy cypress within them. The Northern Bishop Pine series is listed by CNDDDB.

Eight special status plants (CNPS 1 and 2) and one lichen are known to occur on the Forest and 26 others that have been identified as having some habitat potential to occur on JDSF. Habitat potential has been identified by scoping and as well as discussion with DFG.

Fungi and lichen are examples of smaller, less well known organisms present at JDSF. Fungi function as beneficial mycorrhizae, decomposers aiding nutrient cycling, and as pathogens. Fruiting bodies may include mushrooms that benefit wildlife and human foragers. The area known as Mushroom Corners near the intersection of roads 408 and 409 is utilized by several universities, colleges and scientific societies for educational and scientific purposes.

## History of Jackson Demonstration State Forest

Caspar Creek and the Caspar Lumber Company were named after Siegfried Caspar, a German immigrant who owned a cattle operation in this area. Initial logging on what is now JDSF began in 1862 when the Kelley and Rundle sawmill, supplied by a surrounding 5,000 acres of virgin redwood land, started operating near the mouth of Caspar Creek (Wurm 1986). In 1863 Jacob Green Jackson, a lumber dealer who owned lumber yards in Stockton and San Francisco, bought out the owners of the Kelley and Rundle operation and founded the Jackson Lumber Company. Lumber from the Caspar Lumber Company was transported to markets, mainly San Francisco, by schooners until the early 1930s.

In February 1946, C. J. Wood, the president of Caspar Lumber Company, offered to sell up to 51,000 acres of the company lands to the State at a reasonable price. A condition of sale was that the company could operate up to 15 years on some reserved old-growth timber. The State finally entered into a contract with the company to buy the lands on January 31, 1947 for one and a half million dollars. The purchased lands were named Jackson State Forest after the original owner of the land, Jacob Green Jackson. For tax reasons, C. J. Wood chose to transfer the properties to the state in five separate transactions, the last of which took place in 1951. Separately from the Caspar Lumber Company transactions, the Mendocino Woodlands Recreation Demonstration Area was added to JDSF at approximately the same time. This 5,425-acre property had been acquired from the Mendocino Lumber Company in 1935 by the U.S. Resettlement Administration, and was being administered by the National Park Service. The property was conveyed by deed to the Division of Forestry on September 11, 1947, and incorporated into JDSF. Map Figure 1 shows the current

area of the State Forest.

Prior to the first harvest entries in JDSF beginning in the 1860s, most of the Forest can be assumed to have been virgin old-growth. The coastal watersheds were largely clearcut until the 1930s when developing tractor technology and other factors allowed partial harvesting to extend further inland.

The earliest harvests in the original old-growth forest in the area which now constitutes JDSF were done with primitive technology, relying on rivers to float logs to the mill. This limited logging occurred within the Caspar Creek drainage immediately above the Caspar Mill, and along the lower slopes above the larger watercourses such as the South Fork of the Noyo River and the North Fork of Big River. The late 1800s witnessed the introduction of railroads and steam yarders. Most of the stands from the coast inland, up to the Chamberlain Creek drainage, were clear cut with this technology. Forest management was largely non-existent during this period. Emphasis was placed upon extraction of what seemed like a virtually inexhaustible resource of old-growth trees, and upon overcoming the challenges of logging and transporting very large trees with the primitive technology of that era. By 1947 when the State acquired Caspar Lumber Company's holdings, most of the coastal watersheds such as Caspar and Hare Creek, had regenerated to even-aged stands of 15 to 60 year old second-growth timber, though post-logging fires had burned through many of the regenerated stands.

Caspar Lumber Company started partial cutting toward the east end of the Forest in the late 1930s, in the Chamberlain Creek drainage. After acquiring the Forest, the State continued partial cutting in this drainage and the James Creek drainage during the 1950s and 60s. This first round of partial harvest was an individual marked tree cut that removed about 70 percent of the conifer volume. As a result, most of the large old-growth trees were removed. This initial cut was followed by a diameter limit harvest that removed most remaining conifer trees greater than 22 inches in diameter. This harvest pattern on the east end of the Forest resulted in an irregular uneven-aged stand structure, characterized by a relative abundance of hardwoods, poletimber and small sawtimber-sized young second-growth conifers, and individual scattered residual old-growth conifers.

This kind of irregular stand structure is typical of current stands on the east end of the Forest, and distinguishes this area from the western and central areas of the Forest. Although the more westerly portion of the Forest was subject to partial cutting of many second-growth stands, it has retained a more uniform stand structure due to the early history of large-scale clearcutting within the coastal watersheds.

In the late 1950s, after most of the old-growth areas within JDSF had been entered, managers began to investigate the feasibility of harvesting second-growth stands. Since the oldest second-growth stands were located within the Caspar Creek watershed, the first second-growth harvest on the Forest took place there. Harvest in second-growth stands subsequently occurred in the Caspar, Jughandle, Hare Creek, and South Fork Noyo River watersheds during the 1960s.

Management of JDSF has made use of both even-aged and uneven-aged systems. The first even-aged harvest in second-growth within the State Forest occurred in Caspar Creek in the early 1960s. It was not until the 1980s that a substantial proportion of harvesting in second-growth stands consisted of forms of even-aged management. A range of silvicultural methods has been in use on the Forest, for research and demonstration projects as well as operational forest management (Lindquist 1988). Harvest on JDSF has generally involved longer rotations and less frequent re-entries than on most industrial timberlands within the region.



## **Chapter 2. Existing Forest Conditions**

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### **Current Forest Management**

The discussion in this section reflects management of JDSF under the 1983 and earlier forest management plans. In practice, management practices on JDSF continue to evolve gradually over time, reflecting changing societal, professional and research priorities.

The legal mandate for management of Jackson Demonstration State Forest is to research and demonstrate financially viable sustainable forestry practices in a broad range of forested habitats and forest structure conditions in the North Coast region of California. The North Coast region contains a large variety of forest stand types, and landowners practice a broad range of harvesting and forest management techniques. The owners of these working forests benefit from the research and demonstration that JDSF and other demonstration forests provide.

In order to be truly sustainable, forest management must maintain the ecological processes and biological diversity of the forest and its watersheds. To this end, JDSF management has maintained and developed a diverse range of forest habitats and stages of forest development. The diversity of forest conditions that have been cultivated on JDSF through 60 years of management offers unique opportunities for research and demonstration. The variety of forest structures found on JDSF, from recently regenerated stands to old-growth, make the Forest an enormously valuable resource as a working forest laboratory for research and demonstration. Forest structure, inventory, and growth are monitored on a regular basis, and the information is used to predict both future structure conditions (including wildlife habitat characteristics and values) and forest growth and yield.

JDSF is managed under sustainable forestry principles. Annual harvest has averaged well below annual growth. As a result, many second-growth stands on the Forest are growing older and becoming increasingly stocked with larger trees. An integral part of management is the regular harvest of a sufficient acreage to maintain an adequate representation of early to mid seral forest structures. These “maintenance” harvests may not have an immediate research function, but they serve the essential purpose of maintaining the range of forest structure conditions necessary to stay relevant as a managed research forest. Every timber sale on JDSF has not had a direct research purpose, but every timber sale has contributed in some way to cultivating the range of forest structure conditions necessary to remain relevant as a working research and demonstration forest.

Watershed protection levels at JDSF have been, and will remain high. This level of protection offers unique research opportunities, including the opportunity to test and monitor the effects of proposed new regulations. Forest restoration is an essential element of forest management, providing opportunities to test and monitor both active and passive approaches associated with management of riparian zones, the forest road system, older forest structures, and habitat development.

The development of high value forest products culminates in the sale of forest products to private entities, which contributes to the local economy. Timber sales, described in greater detail below, may be of varying sizes, with substantial variation in the harvest methods and the volume of timber that is made available. Minor forest products, including firewood, mushrooms, and greenery are also offered to small businesses and the general public.

### **Forest Structure**

Forest structure refers to the unique combination of tree species, tree sizes, tree numbers, and tree spacing, along with other forms of vegetation (e.g., shrubs, forbs, grasses, and fungi) that can become established among and beneath the trees. The structure of a forest is reflective of conditions that promote regeneration and growth of the vegetation. Vegetation responds to opportunities to regenerate, and subsequent growth is influenced by available light, moisture, and nutrients. As a forest develops, the vegetation competes for light and moisture, creating abundant diversity of conditions. The removal of trees, as individuals or in groups, creates openings in the forest, and opportunities for regeneration and remaining vegetation to occupy these spaces.

Depending upon the amount of light that reaches the forest floor, various species of brush, forbs, and grasses may become established and persist. As forest stands change, due to natural development or stand management activity,

the spacing and size of the trees is variable, and the level of undergrowth will change. This dynamic is commonly referred to as vertical and horizontal diversity.

Historic management and natural forest development have combined to produce a mix of conditions within the Forest. Most of the original old forest was harvested by the Caspar Lumber Company between 1860 and 1955. Where this harvesting involved the cutting and burning of entire stands, which was common practice prior to the 1940s, the resulting young forest developed in an even-aged condition, where most of the trees are of nearly the same age and the forest canopy tended to become closed very early. This canopy condition tends to inhibit the growth of brush and forbs near the ground surface. After World War II, the cutting of old forests tended to be conducted in increments, where the larger trees were removed initially, followed by subsequent removal of smaller trees on one or two occasions. These conditions are prevalent in the North Fork of the Big River watershed and its tributaries (Chamberlain and James Creek watersheds). Each time that these areas were harvested, an opportunity was created for young trees to regenerate, so these areas tend to be occupied by stands with trees in two or more distinct age classes, along with scattered residual old trees that were not cut due to size, defect, or logistical circumstances.

Active management of young forest stands began during the 1960s. This management involved multiple forms of partial cutting as well as clearcutting. Clearcutting of young forest occurred primarily during the 1980s and early 1990s. Where this practice occurred, the resulting forest is very young and even-aged, rapidly approaching a closed canopy condition where the high level of shade will impede the development of brush and forbs. Where partial cutting methods have been employed in young stands, conditions are variable, and these stands are commonly characterized by having trees of two or more distinct ages, as well as having some brush and forbs growing under the canopy due to increased levels of light produced by the removal of trees.

The principal conifer species present within JDSF are coast redwood and Douglas-fir. These species commonly occur together within the Forest, with redwood typically more prevalent. Other minor conifers are present, including grand fir, hemlock, and bishop pine.

Most of the forest stands also include a hardwood component, with the predominant hardwood species being tanoak. Other hardwoods that occur include Pacific madrone, red alder, and live oak. Within conifer-dominated stands, the hardwoods are generally incapable of attaining the same height growth as the conifers, and eventually occupy a place below the crowns of the taller conifer trees.

There are a few remnant stands of virgin old-growth within the Forest, in addition to several hundred acres of partially harvested old forest. Structural components characteristic of older or late seral forest stands (e.g. snags, down logs, live trees with cavities and large limbs) exist throughout the forest at various levels.

The property has been conservatively harvested, resulting in a relatively high volume of standing timber. Because growth exceeds harvest, the forest continues to build inventory, and management has fostered the development of a broad range of structure conditions.

## **Resource Inventories**

Estimates of timber volumes and other vegetation characteristics are derived primarily from a system of plots referred to as the JDSF Forest Resources Inventory (FRI). The inventory used as a basis for the Option A incorporates several thousand inventory plots. The system of inventory plots, currently numbering approximately 5,000, is replaced on a periodic basis.

Forest inventory has been monitored since 1959 through the implementation of a Continuous Forest Inventory (CFI) system. A 60 by 60 chain grid of 141 one-half acre permanently monumented rectangular monitoring study plots was installed throughout the Forest. The system was designed to track changing forest conditions and structures within reasonable tolerances for the Forest overall. Period measurements have been completed approximately every 5 years since 1959 using the original plot design. The most recent measurement of the CFI plots occurred in 2005. The JDSF CFI system constitutes one of the longest and most detailed time series of vegetation monitoring data in existence.

Historical harvests on the Forest have averaged 28 million board feet per year over the most recent 20 years of normal operation.

## **Timber Sale Program**

The State Forest plans and schedules regular timber sales as directed by Board policy and existing management plans.

Forest product sale transactions are broken into two categories based on size, Class I sales and Class III sales (an intermediate Class II category was discontinued in 1976). Class I sales are limited to no more than 100 thousand board feet in volume, and cannot exceed \$10,000 in value. These sales tend to consist of salvage operations, power line right-of-way clearance, and other small lots of timber. Class I sales of other forest products typically include firewood, split products, poles, greenery, and mushrooms. The Department of General Services exempts CAL FIRE from the requirements for competitive bidding for Class I sales, although these sales can be bid when it is appropriate. (For example, it may be desirable to use a bidding process to select a purchaser of a small sale when there are many people interested.)

Class III sales cover the major timber sale program, and are awarded through a competitive bidding process. Sale volumes have ranged from 100,000 board feet to more than 15 million board feet. Most sales have been between 5 and 12 million board feet. A Timber Harvesting Plan is prepared for each major timber sale.

Following consultation with the forest manager and forest staff, and after review of the Management Plan a timber harvesting plan and sale contract are prepared. The sale is appraised and advertised. A prospectus for each sale is sent to persons and organizations found on a mailing list that currently has about 100 names of potential purchasers, local logging contractors, and other interested parties. The sale is also listed on the California State Contracts Register website.

An advertising period of four to five weeks is typically provided to allow purchasers and contractors ample time to evaluate the sale and the contract provisions. Sales usually have bid dates in late winter or early spring, which allows the contract to be awarded and approved and operations to begin shortly after the end of the winter period.

Sale contracts are valid for one to two operating seasons, depending on the volume to be logged, the amount of new road to be constructed, the complexity of the operation, and how early in the year the sale is awarded. Normally, the contract for a sale of less than six or seven million board feet will be designed for completion in one season, and a larger sale will run for two seasons.

In most cases, the lead forester during sale preparation will serve as the contract administrator during the operational phase. This provides continuity of site-specific familiarity and ensures immediate feedback on the strengths and weaknesses of the harvest design. Administrative inspections are intended to ensure compliance with the timber sale contract. Inspections of the sale area are made at least weekly, and more often during critical or sensitive phases of operation. Additional administrative duties include monitoring harvesting progress and the request of stumpage payments on a timely basis.

State Forest sale administrators do not double as CAL FIRE Forest Practice inspectors on the sales which they administer. THP review and inspection for the purpose of compliance with the Forest Practice Rules is performed by CAL FIRE inspectors who are not State Forest staff. The contract administrator's responsibilities extend beyond the completion of timber harvesting, to include inspection and arrangement of maintenance of erosion control facilities during the maintenance period, and ensuring that harvest units meet stocking requirements.

## **Recreation**

Recreational opportunities found on Jackson Demonstration State Forest are unique to the coastal region. They are informal, free of charge, unsupervised, and diverse. Primary recreational activities include camping, picnicking, hiking, biking, driving, horse-back riding, and hunting.

The objectives of the previous forest management plan developed in 1983 were to provide facility development sufficient to meet the projected average peak demand while remaining compatible with management of the timber resource, and to use recreation demand as an opportunity to inform the public about JDSF's timber and research activities. In the past 10 years, average peak demand has not been quantified other than by tracking the annual camping days per year. Although the past 10-year period has averaged 16,000 overnight-use days per year, the total number of visitor-use days exceeds this by an estimated factor of three when day-use visitors are included.

Although public use on the Forest has not diminished over time, priorities for implementing a recreation program have fluctuated with political goals and their resultant budgets. The goal of integrating recreation management, forestry education, resource protection and timber harvesting to demonstrate compatible use has been ongoing by default since the State Forest's inception as well as with directed attention.

With the exception of the two Conservation Camps and areas undergoing active timber operations, nearly all of the 48,652-acre forest is open for public access. There are 21 campgrounds within the boundaries of JDSF, and most of these offer opportunities for swimming or wading. The road system and easy access from Fort Bragg, Mendocino and Willits allows for extensive day use. It is estimated that day use comprises at least three times as many visitor-days as overnight camping. Unlike the surrounding smaller State Parks, JDSF has more roads available for use and allows a wider range of recreational uses (horse back riding, mountain biking, and hunting). JDSF does not collect any fees for recreational uses but does provide considerable public value to the visitors.

The majority of visitors live in Mendocino County, but an increasing number of visitors are from outside of the county. The rise in non-local visitors may be attributed to increased publicity from travel guides, a general increase in tourist travel to the north coast, and perhaps in the future from the Internet. Campgrounds are always full for the holiday weekends during the summer. The majority of the campsites are open seasonally.

## Facilities

Maintenance of existing facilities has been the primary recreation management objective for the past several years. As staffing levels and budgets varied over the years, priorities fluctuated. The majority of recreational facility maintenance has been made possible by utilizing JDSF staff and crews from the two Conservation Camps located on the Forest.

Camp Host sites are located on the Forest at the two multiple-site campgrounds: Camp One (west end) and Dunlap Camp (east end). Information and camping permits can be obtained from the Camp Hosts. Currently, the only other locations where information can be obtained are from the JDSF headquarters (Fort Bragg) or the Mendocino Unit headquarters (Willits) during business hours on weekdays. Camp Hosts have been key in reducing the frequency of vandalism to campground and day-use facilities. Their physical presence acts as a deterrent, as does their routine maintenance of campground facilities.

The trail system on the Forest varies from designated self-guided interpretive trails and developed hiking trails to skid trails and logging roads (both old and new). There are four designated non-interpretive hiking trails that are located in JDSF: Camp One Loop, Trestle, Waterfall Grove, and Woods Trail. These trails are primarily limited to foot traffic travel although other non-motorized uses are not restricted. The Sherwood Trail is part of a regional trail designed for equestrian use that is not maintained by JDSF and continues into Fort Bragg across private property.

## Road Management

The road system serves as the main point of public contact with the forest, and also serves as the conduit for management activities, including the transportation of staff, researchers, equipment, and forest products.

Forest roads on JDSF are used for timber harvesting, forest management activities, forest protection, public access, and recreation. The current road network reflects a history of various transportation technologies and forest practices. Beginning in the 1870s, railroads were used to transport logs in some watersheds and railroad grades were located along or adjacent to streambeds. Some JDSF roads use remnants of the old railroad grades in several places.

Most of the roads on JDSF, however, were constructed from the 1950s to the 1970s. Roads constructed during this period generally included an inboard ditch and cross drains. Concentrated runoff from this type of road has been shown to be a major source of fine sediment, because the inboard ditches are often connected directly to stream channels (Wemple et al 1996). Improvement of JDSF roads to reduce sediment yield is a priority for management.

## **Minor Forest Products**

The Department currently offers the public and private commercial interests the opportunity to purchase minor forest products, subject to specific rules and constraints. At present, permits can be purchased for collection of products including salvage sawlogs, poles, split products, greenery (e.g., boughs, shrubs, and ferns), mushrooms, and firewood. Class I sale permits are issued for the collection of these minor forest products.

### **Salvage Sawlogs**

Logs may be purchased from the State Forest, subject to permit constraints and applicable state regulations. Payments are generally made on the basis of log volume removed from the State Forest. The purchaser is responsible for paying all applicable yield and sales taxes. The removal of salvage sawlogs requires the purchaser to be in possession of a valid timber operator's license. Prices for logs to be removed are subject to negotiation between the purchaser and the State Forest manager. All timber operations are limited by the Forest Practice Rules and constraints established by the State Forest manager. Typical State Forest constraints include provisions for clearance from watercourses, slope limitations, wet weather restrictions, and pre-location of yarding and hauling facilities. All log locations are pre-specified. No logs and wood products originating from standing snags or old-growth trees may be collected.

### **Firewood**

Firewood permits are available from the Forest. Firewood collection permits can be purchased for personal and commercial purposes after payment of a fee. Commercial producers are responsible for payment of all applicable taxes. Firewood collection is limited to dead and down material, and does not include either old-growth material or potential conifer sawlogs. Firewood collection is limited to pre-designated areas, and is generally subject to constraints such as watercourse clearance, slope limitation, weather conditions, retention of sufficient LWD for forest structure purposes and access road designation.

### **Greenery**

Permits to collect greenery are available to the public. Very little of this activity occurs, but a few permits are issued every year. In recent years, permits have been issued for the collection of Douglas-fir boughs, ferns, salal, and huckleberry brush. Payment varies by product, being either on a volume basis or an item basis.

### **Mushrooms**

Mushroom collection permits may be purchased for both personal use and commercial collection. Collection volume is limited, although areas of collection are not constrained.

### **Poles and Split Products**

Permits may be purchased for collection and manufacture of poles and split products. Old-growth material may not be collected. Payment is made on an item or volume basis, and the purchaser is responsible for payment of all applicable taxes. Typically, poles are derived from thinning of young redwood/Douglas fir stands. Very little split product is manufactured, due primarily to the restriction against collection of old-growth material. Areas near watercourses are restricted in order to retain large woody debris with specific ecological value.

Periodically, the State Forest manager establishes permit prices, volume or numerical limits, and conditions of collection for the various minor forest products collected by the public. For personal use items, permit prices are nominal and are intended to cover the costs of administration of the permit process. Conditions of collection, collection location and collection limits (volumetric or numeric) are based upon an assessment of potential impacts that could result from the collection process and removal of the resource.

## **Research and Demonstration**

This section discusses the general research and demonstration mandate for JDSF and how it affects the kind of forest

