III. PROJECT INFORMATION

1. PROJECT LOCATION

JDSF is located entirely within Mendocino County along Highway 20, roughly between U.S. Highway 1 (near the towns of Fort Bragg and Mendocino) and Highway 101 (near the town of Willits; see Figure III.1). JDSF is located approximately 140 highway miles north of San Francisco and 130 highway miles south of Eureka, California. The area comprises approximately 48,652 acres (76 square miles). The western boundary of the State Forest comes within about 1½ miles of the coast. The Forest extends inland (eastward) about 16½ miles. The north/south size dimension varies from over seven miles at the western end of the Forest to as little as 2½ miles at the center.

2. PROJECT PURPOSE, GOALS, AND OBJECTIVES

Establishing the purpose, goals and objectives of a proposed project are important in the EIR development process. CCR §15126.6 states, “An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project …”. Alternatives need not be considered when they do not meet most of the basic project objectives (see section VI, Alternatives).

The overriding purpose, goals, and objectives for State demonstration forests in general are clearly set forth by the California legislature and in the Board Policies. (Relevant statutes, code, and Board policies governing state forests is located in Appendix 5.) This guidance sets the framework for specific purposes, goals and objectives as specified in the JDSF Management Plan. Each is discussed below.

Purpose

The purpose of the JDSF Management Plan is best understood from a tiered perspective built upon legislative intent, Board Policy, and Department planning. Each must be considered with the other.

The California State Public Resources Code sets forth the legislative purpose of the JDSF as follows:

- Demonstration of economical forest management (PRC §4631(d))

  "Management" means the handling of forest crop and forest soil so as to achieve maximum sustained production of high quality forest products while giving consideration to values relating to recreation, watershed, wildlife, range and forage, fisheries, and aesthetic enjoyment (PRC §4639).

"Forest products" includes sawlogs, pilings, poles, split products, pulpwood, bolts, bark and other products (PRC §4638).

- Retain the existing land base of state forests in timber production for research and demonstration purposes (PRC §4631.5(a)).
- The management of state forests and the cutting and sale of timber to achieve maximum sustained production of high-quality forest products, while giving consideration to values relating to recreation, watershed, wildlife, range and forage, fisheries and aesthetic enjoyment (PRC §4651).

Consistent with the legislative purpose, Board Policies 0351.3 and 0351.2 provide additional statements of purposes and priorities as follows:

- The Board, consistent with PRC §4631, recognizes and reaffirms that the primary purpose of State forests is to conduct demonstrations, investigations, and education in forest management. The Board wishes to emphasize and expand demonstrational, experimental, and educational activities on the State forests (Policy 0351.3).
- Timber production will be the primary land use on JDSF (Policy 0351.2(A)).
- Recreation is a secondary but compatible land use (Policy 0351.2(B)).

Consistent with all the above, the JDSF Management Plan's stated purposes are as follows:

- Guide the integrated use and protection of the Forest's resources;
- Meet requirements of legislation and Board policy;
- Address local regional and statewide issues.

Collectively, the purpose of the JDSF Management Plan is therefore identified as each of these tiered and interrelated purpose statements.

Goals and Objectives

As stated above, Board Policy 0351.3 (et al.) sets forth goals and objectives for demonstration forests consistent with legislative purposes. Appendix II of the JDSF Management Plan provides specific project goals and objectives consistent with Board policy. They are repeated below.

Goal #1. Research & Demonstration: Improve the amount and quality of information concerning economic forest management and timber management methods that is available to the general public, small forest landowners, resource professionals, timber operators, and the timber industry.

Objectives:

1-1. Conduct resource management demonstrations and investigations directed to the needs of the general public, small forest landowners, resource professionals, timber operators, and the timber industry.

1-2. Conduct monitoring of resource management activities to gauge their effectiveness in meeting project objectives.

1-3. Demonstrate the compatibilities and conflicts involved in multiple use of forestland, and investigate methods to mitigate conflicts.

1-4. Ensure that knowledge gained is also shared by disseminating information obtained through research and demonstration to the general public, forest landowners (especially small owners), resource professionals, and timber operators.

1-5. Establish a Forest Education Center at Jackson Demonstration State Forest to support and facilitate forest management research and learning activities.

1-6. Accelerate the expansion of knowledge about redwood forests by seeking increased funding to support research and demonstration projects.

1-7. Consult and cooperate with universities and colleges, the U. S. Forest Service, and other public and private researchers in conducting research and demonstration projects. Enter into cooperative agreements for investigations of mutual interest. Make the State Forest available to educational institutions and other agencies for research and demonstration projects.

Goal #2. Timber Management: Manage the Forest to maintain a wide range of age classes and diverse stand structures for research. Manage the Forest on the sustained yield principle, defined as management which will achieve continuous high yields of timber production that contribute to local employment and tax revenue, consistent with environmental constraints related to watershed, wildlife, fisheries, and aesthetic and recreational enjoyment.

Objectives:

2-1. Manage forest stands to produce sustained yields of high quality timber products and public trust resources. Maintain flexibility in forest management in order to provide a comprehensive demonstration, education and research program.

2-2. Include a sustainable regulated growing stock as a feature of the State Forest's desired future condition. Establish stand-level rotation ages and cutting cycles to meet sustained yield objectives, and set a forest-level allowable annual cut that will lead towards achievement of the desired future condition. Project the short

term, site-specific harvest schedule at least 5 years into the future, and the long-term schedule at least 100 years.

2-3. Implement state of the art forest management practices to increase total wood production and improve timber quality, designed and carried out for maximum applicability and demonstration value for private lands.

2-4. Contribute to the vitality and stability of the economy of the North Coast of California by conducting regular periodic timber sales.

Goal #3. Watershed and Ecological Processes: Promote and maintain the health, sustainability, ecological processes, and biological diversity of the Forest and watersheds during the conduct of all land management activities.

Objectives:

3-1. Maintain a diverse, dynamic matrix of forest habitats and seral stages suitable for a wide variety of native fish and wildlife populations. Manage designated old growth reserves for maintenance of late seral habitat values.

3-2. Maintain and recruit structural elements necessary for properly functioning habitats. In riparian areas, manage for late seral habitats, while allowing flexibility to conduct research on riparian protection zones. Create or naturally develop recovery habitat for listed species.

3-3. Determine which native species, in addition to listed species, are most susceptible to adverse impacts from land management activities and which, therefore, warrant extra concern.

3-4. Provide protection to listed species, to species of concern, and to their occupied habitats. Avoid disturbance to uncommon plant communities such as meadows and pygmy forest.

3-5. Utilize forestry practices that will maintain stability of hillslope areas and control sedimentation caused by accelerated mass wasting and surface erosion.

3-6. Monitor the development and condition of terrestrial and aquatic habitats over time, and apply adaptive management principles to ensure that goals are met.

3-7. Implement a comprehensive road management plan to reduce sediment production, including upgrading roads remaining in the permanent transportation network and properly abandoning high-risk riparian roads where possible.

Goal #4. Forest Restoration: Work toward achieving a balanced mix of forest structures and attributes in order to enhance forest health and productivity.

Objectives:

4-1. Restore and decommission roads to minimize WLPZ and unstable roads.

4-2. Minimize sediment production from roads.

4-3. Increase the amount of late seral forest.

4-4. Add large woody debris to streams and enhance overall habitat conditions for salmonids.

4-5. Add forest structural elements to stands (snags, large trees, large diameter limbs, cavities, flat tops).

4-6. Minimize the influence of exotic plants and animals.

4-7. Cultivate conifer stands capable of producing high quality sawtimber, on the east end of the Forest.

Goal #5. Recreation and Aesthetic Enjoyment: Plan for and provide low impact recreational opportunities that are compatible with forest management objectives and healthy ecological processes, and that are consistent with historic recreational use characteristics.

Objectives:

5-1. Base the development of future recreation programs and facilities on a plan that assesses needs, opportunities and available resources.

5-2. Maintain campgrounds, picnic areas, trails and other recreational facilities in a safe, healthy and attractive condition.

5-3. Continue to utilize a style of recreational improvement that is generally low impact and rustic in nature. Develop campground and day use areas so that they are concentrated in identified recreation corridors.

5-4. Demonstrate that recreation and timber management are compatible land uses through the integration of recreational development and use with timber harvest activities. Utilize this opportunity to explain forest management to the recreating public. Include appropriate mitigations in harvest plans that may impact recreation and aesthetic values.

5-5. During timber management activities conducted adjacent to residential areas, consider and mitigate the project's effects on the casual and informal recreational uses of the State Forest by the Forest's neighbors.

5-6. In cooperation with the California Department of Parks and Recreation, establish forest management demonstration areas compatible with recreation for educational purposes adjacent to the Mendocino Woodlands Outdoor Center and the Pygmy Forest Reserve.

5-7. Ensure that future recreational uses are consistent with protection of Heritage Resources. (Note: This objective was added by CDF during the EIR process.)

Goal #6. Information & Planning: Develop, maintain, and update management plans and other planning documents and processes. Manage and support the information needs of all State Forest programs.

Objectives:

6-1. Collect, process, interpret, analyze, update, store, index, and make retrievable the array of information and data about the State Forest and its resources needed to support Forest planning and management.

6-2. Prepare, monitor and update State Forest Management Plans and program area plans.

6-3. Initiate an adaptive management process for all phases of State Forest planning and plan implementation. Monitor forest operations and make modifications as necessary to achieve management goals.

6-4. Provide opportunities for public and other agency input into planning processes.

Goal #7. Protection: Protect the Forest from damage and preserve the peace within.

Objectives:

7-1. Preserve native plant species. As feasible, prevent establishment of new exotic invasive plants and take action to prevent spread of existing populations of exotic invasive plants. Protect native communities from insect, disease, and plant pests using the concept of integrated pest management. (Note: This objective was modified by CDF during the EIR process.)

7-2. Include fire hazard and risk assessment in forest planning. Manage forest fuels to reduce the incidence and severity of wildfire. Incorporate a fire protection and pre-attack plan into the State Forest management plan.

7-3. Maintain a physical presence in the Forest to enforce forest and fire laws. Make regular contact with forest users to ensure understanding of and compliance with regulations and use limitations. Use public contact as an opportunity to deliver forest management education messages.

7-4. Inventory and protect historic and pre-historic archaeological resources. Identify and prioritize archeological sites that are susceptible to disturbance and schedule data collection prior to planned activities.

Goal #8. Minor Forest Products: Maintain a program that provides an opportunity for the public and small businesses to purchase minor forest products.

Objectives:

8-1. Continue to make both personal-use and commercial firewood available following timber harvesting operations.

8-2. Restrict the utilization of forest products where potential environmental effects are unacceptable, such as cutting of green redwood burls, manufacture of split products from desirable large woody debris, and salvage of wind-throw from riparian areas.

8-3. Increase opportunities for small-volume sales.

8-4. Consider a system for contracting logging and selling delivered logs.

Goal #9. Property Configuration: Improve the boundary layout of the State Forest to facilitate management logistics and increase demonstration and research opportunities.

Objectives:

9-1. Consider making boundary line adjustments through cooperation with neighboring timberland owners to configure state forest boundaries to ridgelines and watershed boundaries.

9-2. Seek to reduce private in-holdings through purchase or exchange.

9-3. Investigate opportunities to purchase additional forest land to add to the State Forest, particularly where it completes ownership of a planning watershed, creates new or adds control over important road access, or provides new opportunities for research and demonstration projects.

3. PROJECT DESCRIPTION

The project being described includes the JDSF Management Plan and those physical actions likely to result from the adoption of the Management Plan. The determination of such actions is speculative to a degree; however, many potential actions are reasonably foreseeable and set forth in sufficient detail within the DFMP to determine environmental effects, at least on a program level. To assist in determining reasonably foreseeable

actions, an overview of the types of activities that are the focus of the DFMP is provided below.

3.1 Actions Associated with Forest Management

The JDSF is managed for a variety of benefits, including demonstration projects in forest management, watershed, fisheries, and wildlife. CDF cooperates in forest research and demonstration projects with other resource agencies, the University of California, Humboldt State University, California Polytechnic State University, the U.S. Forest Service Redwood Sciences Laboratory, and others.

JDSF has an estimated timber inventory of more than 2 billion board feet, with a total annual growth level estimated at approximately 65 million board feet (MMBF). Accounting for constrained areas and areas unavailable for timber production, current annual growth from the unconstrained areas is estimated at approximately 40 to 50 MMBF. The target harvest level established in the 1983 Management Plan was 29 MMBF. The average annual harvest level on JDSF from 1980 until court-ordered restrictions of recent years has been approximately 28 MMBF. This timber is sold annually to bidders, harvested by local logging contractors, and is shipped to a number of sawmills throughout the redwood region and California. Substantial numbers of jobs are produced by this timber management activity, as well as tax revenues.

Construction or reconstruction of roads is necessary to access certain harvest areas. Roads are occasionally decommissioned when timber harvests are complete or when road removal is needed to restore sensitive areas, such as riparian zones.

The Forest is home to a number of sensitive fish and wildlife species, including the northern spotted owl, coho salmon, and steelhead. The Forest provides habitat for a large number of species. Habitat protection and restoration is an important element of forest management activities. Over the past several years, significant efforts have been made to demonstrate the improvement of aquatic habitat by re-introducing large woody debris, an essential habitat element, to selected reaches of local streams. In addition, many miles of unnecessary roadways have been decommissioned, or “put to bed”, in an effort to reduce the potential for sediment delivery to nearby watercourses. In upland areas, the Forest has provided demonstrations of harvest systems that are intended to retain and recruit essential habitat elements for terrestrial species, such as large trees, snags, and down logs.

The public also utilizes JDSF as an important recreational resource. There are over 60 individual campsites, many miles of riding and hiking trails, and over 200 miles of forest road utilized by the public. Maintenance of these facilities is an important management component. Other common recreational activities conducted on the Forest include picnicking, hunting, swimming, wildlife viewing, and target shooting. The Forest is also a local source of firewood and other minor forest products such as mushrooms and greenery for both personal and commercial use.

3.2 Potential Actions Resulting from Project

Two types of actions can result from adoption of the JDSF Management Plan. On-site actions are the most common. They are more readily identifiable and quantifiable. Off-site actions may also occur such as those due to the hauling of forest products for off-site processing. Important, but often overlooked, off-site actions also result from the application of forest demonstration practices to other areas. Increasingly, demonstration practices emphasize innovative research for protection of the environment.

Certain actions would occur under either the existing Management Plan or the proposed DFMP. The intent of this EIR is to show all actions resulting from the proposed Plan regardless of whether they are continuing or proposed actions. This allows the assessment of impacts from a baseline of existing conditions (CCR §15125). As stated earlier, a comparison of the current Management Plan with the proposed Plan is provided in section VI, Alternatives.

For purposes of CEQA review, "actions" also may include measures to protect specified areas from disturbance. Potential on-site and off-site actions are discussed below.

For further discussion of the relationship between the Plan and the draft EIR, the scope of the project, and level of specificity see section II.6.

3.2.1 Potential On-site Actions

Research and Demonstration Programs: As stated earlier, the JDSF was acquired for the purpose of demonstrating economical forest management and timber production. One of the more challenging issues in forest management concerns the level of environmental protection and mitigation needed to avoid significant environment damage and to comply with the applicable regulatory standards of the various local, State, and Federal resource agencies. Accordingly and over time, many research and demonstration projects have shifted in focus from timber production to environmental impacts and the efficacy of environmental protection measures as they relate to timber production (DFMP, Chapter 4).

If the benefits of research and demonstration programs are to be applied in as many areas as possible (primarily in California, but also out-of-state), it is important that the Forest promote a range of timber types (including species, age, and age-mix), practice a variety logging activities, and maintain a diversity of habitat types for study.

Dissemination and presentation of information gained also is essential in the application of research to areas outside JDSF. To this end, the JDSF Management Plan recommends several measures including collaboration with universities and other resource agencies, developing a State data bank, and tours of demonstration areas.

Within approximately 10 years, a Forest Learning Center and an Interpretive Center is envisioned. Within the last two years, the initial phase of the Forest Learning Center, consisting of construction of an office/barracks building, has been completed. These facilities, when implementation plans are fully developed, would be subject to separate environmental reviews when more information is known regarding funding, timing, size, and location.

Demonstration and research programs will result in long-term improvements to environmental conditions on JDSF. More importantly, these programs will result in widespread environmental protection and conservation outside of JDSF as intended by the legislature (see "Potential Off-site Activities" section below and "Application of Demonstration Programs"). It is anticipated that the development of improvements in harvesting techniques, erosion control, habitat management, and watershed restoration will be placed into practice on private timberlands throughout the region as the information is made available by the state forest system. Chapter 4 and Appendix IV of the JDSF Management Plan provide a detailed discussion of active or planned research and demonstration programs. Also, refer to section VII 6.3 (Timber Resources).

Individual research and demonstration projects are highly variable. Most projects having to do with the study or demonstration of stand management practices involve the passive measurement of trees and other stand attributes, and do not lead to environmental effects. Actual environmental effects are created by the physical stand manipulation associated with a THP, which is subject to site-specific environmental planning and review. Occasionally, research projects or aspects of research projects have potential to impact the environment (e.g., removing sediment from weir ponds as part of the Caspar Creek Watershed Study). When this potential arises, the project is subject to the provisions of CEQA, a site-specific environmental analysis is conducted, and the project is subject to all other applicable rules and regulations.

Research and demonstration of various aspects of forest management, forest ecology, watershed conditions and impacts, wildlife habitat, and other subjects is routinely conduced within the forest. Some of the principle areas of research and demonstration include the following:

- forest harvest techniques and effects
- silvicultural methods
- general forest management
- wildlife and wildlife habitat; fisheries and aquatic habitat
- watershed resources and responses
- forest ecology
- forest vegetation.

<u>Forest harvest techniques and effects:</u> Forest harvest techniques and effects are demonstrated and research projects are occasionally instituted. Examples include

demonstration of various yarding, road construction, erosion control, and watercourse crossing methods.

Silvicultural methods: Silvicultural methods are demonstrated and researched on the forest. Examples include investigations of regeneration success, rates of growth of residual stands, and comparisons among the various systems.

General forest management: This broad category of research and demonstration includes those subjects not included in more specific categories. Please see the list of demonstrations and research projects that have been conducted on the forest, found in Appendix IV of the DFMP.

Wildlife and wildlife habitat; fisheries and aquatic habitat: This broad category includes things such as fish and wildlife species/habitat relationships, fish and wildlife responses to watershed, vegetative or habitat manipulation, alteration of habitat conditions or components, habitat restoration, etc.

Watershed resources and responses: This broad category includes examination of watershed resources, including soils, vegetation, geology, hydrologic properties, erosion processes, stream sedimentation, rainfall, etc. Responses associated with both natural and human-caused changes or events are investigated. One major watershed study (Caspar Creek) involves stream impoundment, weirs, and flumes, for purposes of measuring water and sediment discharge. Sediment deposits are periodically removed from the impoundments.

Silviculture and Timber Harvest: The JDSF Management Plan calls for an increase in uneven-age timber stand management. About 64 percent of the Forest area is allocated to mixed-age stands. The Silviculture Allocation Plan contained in the JDSF Management Plan will facilitate broader ranges of research activities. The DFMP calls for the following structural mixes of forest stand conditions presented in Table III.1.

Under the DFMP, timber sales and harvests would continue at a rate similar to recent active harvest years, typically with three to five sales per year with an annual timber harvest rate of approximately 31 to 33 million board feet.

Harvesting in the Parlin Fork Management Area (approximately 340 acres) is expected to continue at current levels. A small portion of this area is sustainably and selectively harvested on an annual basis to provide logs for the small sawmill operated by the Parlin Fork Conservation Camp. This harvest is exempt from the THP requirements of the Forest Practice Act because the products manufactured from the harvested timber are used by state government and are not sold. (See the definition of “timber operations” in the Act, § 4527.) However, all harvesting is planned or supervised by a CDF forester to ensure that operations meet the standards of the Forest Practice Act and Rules and are consistent with the provisions of CEQA and the Forest management plan.

Table III.1. Planned Structural Condition for JDSF.		
Structural Condition	**Acres**	**Percent**
Unevenaged Structure Condition	**31,294**	**64**
Late Seral (1)	9,680	20
Single Tree/Cluster Selection (2)	12,101	25
Group Selection	9,513	20
Evenaged Structure (seed tree, shelterwood, two-age, variable retention, clearcut) (3)	**14,256**	**29**
Non-Timber and other Areas with Unclassified Structural Conditions (4)	**968**	**2**
Current Silviculture and Watershed Research Areas	**2,134**	**4**
TOTAL	**48,652**	**100**
(1) Old growth groves, Class I and II watercourse riparian zones, Woodlands Special Treatment Area, later seral development areas.		
(2) Singe-tree/cluster management areas, domestic water sources, Neighborhood Buffers, Campground Buffers, Road and Trail Corridors.		
(3) This is the maximum area that could be harvested under an even-aged regeneration system over the next 150 years. Clearcuts (or single-age management) will be used only for research purposes or in the case of stands that are very difficult to regenerate with other evenaged silvicultural systems.		
(4) Cypress groups, pygmy forest, Jughandle Reserve, eucalyptus, powerline right-of-way, conservation camps.		

Timber management on JDSF generally involves allowing trees and stands to reach a greater age (including longer rotations for evenaged management) than on most private industrial timberlands within the region. Over any rolling five-year period, annual harvest averages about 1.4% of the inventory. For further discussion, refer to section VII 6.3 (Timber Resources).

Timber harvest activities are normally conducted pursuant to Timber Harvesting Plans (THPs). These plans are prepared by a registered professional forester (RPF), and submitted to the Department of Forestry and Fire Protection (CDF) where they are subjected to a multi-disciplinary review process as outlined in the California Forest Practice Rules (Title 14 CCR). Each THP incorporates a cumulative impact assessment that normally encompasses one or more planning watersheds, and considers past, present, and reasonably foreseeable future projects specific to the assessment area. The THP regulatory program has been certified by the Secretary of the Resources Agency pursuant to PRC §21080.5, establishing that a THP may be submitted in lieu of the environmental impact report required by the California Environmental Quality Act, [PRC Division 13 (commencing with §21000)].

Under limited conditions timber also may be harvested pursuant to a process that allows for an exemption from the requirement to file a timber harvesting plan. These exemptions may be granted for specific types of activities, or for activities that are generally considered to have minimal potential to create significant environmental

effects. Exemptions can be granted for salvage of dead and dying timber, for clearance of utility rights-of-way, for fire clearance around a home, and for minor conversion operations (ref. Title 14 CCR). While the requirement for preparation of a Timber Harvesting Plan is not applicable, all operational limitations of the Board of Forestry and Fire Protection and the Forest Practice Act are in effect.

The state may harvest timber under certain circumstances that are not regulated under the Forest Practice Rules, only if the timber is not harvested for commercial purposes. However, this does not exempt the Department from compliance with all other applicable rules and regulations (e.g. Fish and Game Code, Endangered Species Act, CEQA, Water Quality Basin Plans). The types of projects where non-commercial operations are expected include the Parlin Management Unit operation (forest management adjacent to Parlin Fork Conservation Camp for purposes of furnishing a supply of logs for the small sawmill sited there) and incidental salvage operations near roadways (where logs are utilized at the Parlin Fork Conservation Camp sawmill).

Timber management operations include all activities necessary to produce, harvest, and transport timber products from Jackson Demonstration State Forest, including the following:

- falling, bucking, and limbing of timber
- yarding, decking, and loading of timber
- transport of timber
- road construction, reconstruction, and maintenance
- borrow pit construction and use
- water drafting for dust abatement and compaction of road and crossing fills
- logging equipment maintenance

Falling, bucking, and limbing of timber: Falling is the practice of dropping standing trees by sawing them off at the base of the trunk. Limbing is the practice of cutting the limbs from the trunk. Bucking is the practice of sawing the trunk into lengths, which are commonly referred to as logs. Falling and limbing are accomplished through the use of chainsaws or mechanized harvesting equipment.

Yarding, decking, and loading of timber: Yarding is the practice of moving logs from the forest area where they are felled to the road or landing where they are to be loaded onto trucks for transportation to mills or other destinations. Ground-based yarding methods commonly utilized include use of tractors, skidders, forwarders, or horses. Aerial methods include cable skyline yarding, other cable methods, and helicopter yarding. Loading of timber onto trucks or other vehicles for transport generally occurs on a road or log landing area, and generally is conducted by wheeled loaders or heel boom loaders. Decking involves the sorting and stockpiling of logs at landing areas for preparation for loading activities.

Transport of timber: Timber is most commonly transported along roads via truck and trailer.

Road construction, reconstruction, and maintenance: Forest roads are constructed most commonly by felling and yarding timber in the path of the road cut, surface, and fill slopes. This activity is followed by excavating or filling hillslope areas with tractors or excavators. Road construction also commonly involves construction of watercourse crossings that utilize culverts, bridges, and occasionally fords. Roads also include log landings, which are wide spots capable of being utilized as storage areas for yarded logs, as well as locations for loading logs onto trucks. Road construction also may involve the surfacing of soil roads with rock, oil, pavement, or other surface treatments.

Road reconstruction involves restoration or improvement of an existing road surface to upgrade the road to a suitable standard for the anticipated use. Reconstruction of roads may involve replacement of culvert, changes in road prism, road surfacing and removal of vegetation.

Road maintenance commonly includes surface grading, clearance of bank slumps, repair of slumping or sliding fills, clearance of ditches, repair or replacement of culverts and bridges, addition of surface material, dust abatement, and installation or replacement of surface drainage.

Borrow pit construction and use: Borrow pits are locations where rock is excavated, crushed, blasted, or otherwise produced for eventual use as a road surface or road fill material.

Water drafting for dust abatement: Water drafting involves the direct drafting of stream flow into a water truck, diversion of stream flows to an in-channel, or off channel storage area, or use of wells for filling of water trucks to obtain water which is then sprinkled or otherwise applied to road surfaces periodically to reduce dust production and help maintain a hard, compact surface or provide water for wetting of fill materials for roads and stream crossings to achieve proper compaction. Occasionally, specific watercourse locations are excavated or dammed to increase in-channel storage area for drafting purposes.

Logging equipment maintenance: The use of falling, yarding, loading, and trucking, and road maintenance equipment requires equipment fueling and maintenance. This maintenance generally occurs on or adjacent to roads and landings.

Silvicultural activity: Silvicultural activity involves the specific methods by which a forest stand or area is harvested and regenerated to achieve the desired management objectives associated with such things as maximum sustained yield or habitat maintenance, alteration, or creation. Specific examples of silvicultural activity include silvicultural methods such as individual tree/cluster selection, group selection, seed tree, shelterwood, variable retention, two-aged stand, and clearcut.

Individual Tree Selection: This silvicultural system creates a forest stand over time with trees of various sizes and ages. The stand is periodically harvested with the objectives of spacing and increasing the growth of the remaining trees, creating room for new trees to grow, adjusting the species composition of the stand, removing deformed, damaged, or diseased trees, and achieving or maintaining a tree desired size distribution.

Group Selection: This silvicultural system creates a forest stand consisting of small patches or groups of trees, with the trees within each patch being approximately the same age. Generally, the groups are between ¼ acre and 2.5 acres in size. A forest stand may consist of 3 or more age groups. Periodically, new groups are created by harvesting and regenerating areas that have become mature.

Variable Retention: This system is designed to manage stands on an even-aged or uneven-aged basis. This system is frequently used on an even-aged basis, where most of the future harvest trees are of the same age. When the initial harvesting is done, some of the trees are retained to maintain or recruit important wildlife habitat components over time. These older trees can be retained in a variety of configurations, thus the term Variable Retention. A new age class of trees is grown under and between the trees that are retained. This system is also used to create un-even-aged stand structures generally where stands are irregular in nature, contain different age classes and where un-even-aged is consistent with the objectives of the landowner.

Seed Tree: The seed tree system is intended to maintain or produce an even-aged stand condition, where most of the trees are of approximately the same age. The system is intended to reproduce by natural seeding. Selected seed trees are retained, spread out throughout the harvested stand, with the intention of obtaining natural reproduction from those trees. After the area is successfully regenerated, the remaining seed trees may be removed.

Shelterwood: This system is similar to the seed tree system, but is generally used when natural conditions make it desirable to retain more of the older trees to act as shelter for the new regeneration. This need may occur in areas subject to intense heat or other natural factors that can make the survival of regeneration difficult.

Two-Aged Stand: This system is designed to produce a stand consisting of trees in two distinct age classes. The first cut in a stand removes a substantial number of trees while providing an opportunity to regenerate a new age class. The two age classes then occupy the site until a second harvest is done to remove the older age class. The removal of the older age class provides another opportunity to regenerate a new age class, and the system is maintained over time in this way.

Clearcut: This system involves the cutting and removal of most or all of the trees from a given area at one time. The size of the contiguous area that can be cut in this fashion is restricted by regulation. After the trees are removed, a new stand is created by planting and by natural seeding and sprouting.

Silvicultural activities are a distinct component of a THP and create stand structural characteristics that extend beyond the administrative life of the THP for several decades. The vast majority of trees cut within the Forest are removed to achieve a specific stand management objective pursuant to a silvicultural system.

Regeneration and timber stand improvement: Regeneration of forested areas is a key objective of the DFMP and also is a requirement of the Forest Practices Act and the Forest Practice Rules. Planning for this activity is a required element of the DFMP and THP. Occasionally, regeneration and timber stand improvement activities are planned

and occur outside of the THP process. In this case, environmental review of the specific project is conducted pursuant to the provisions of CEQA. In addition, all other applicable rules and regulations apply to the planning and conduct of the activity.

Regeneration and timber stand improvement include all activities necessary to establish, grow, and achieve the desired species composition, tree spacing, and rate of growth of young forest stands on Jackson Demonstration State Forest, and include the following:

- tree planting and seeding
- control of competing vegetation
- precommercial thinning and pruning
- controlled burning
- cone collection
- mechanical site preparation.

Tree planting, sprouting, and seeding: Tree planting involves excavation of a small hole into the soil surface, into which a tree seedling is placed. Sprouting is a method of securing new trees from stump sprouts, which are generated from tree stumps. Seeding involves the broadcast application of tree seed by aircraft or other broadcasting device, or in those instances where seed is scarce, planting seeds by hand.

Control of competing vegetation: To provide for successful establishment and fast growth of desired tree species, it is sometimes necessary to control species that compete with desired species for water or crown space. Control methods include mechanical cutting and mechanical chipping. Control is also available by use of chemicals, which are applied directly to target vegetation or applied to soil surfaces, or broadcast application of selective herbicides that affect targeted species. These chemicals are generally applied by a portable sprayer. The chemicals are applied as specified by label instruction. Generally this includes either direct application to leaf surfaces or stems, or to cut surfaces, either cut bark (frill) or stem/stump. Chemicals may also be utilized which act to prevent emergence of competing vegetation. These chemicals are liquid formulations applied directly to soils or leaf surfaces where vegetation control is desired.

Precommercial thinning and pruning: Precommercial thinning involves the thinning of dense young forest trees by mechanical means, including the cutting of individual trees or mechanical sawing or chipping of rows or groups of trees to achieve a target spacing for the residual trees. Pruning is the practice of removing the lower limbs of desirable tree species for purposes of increasing their eventual product value. Limbs are generally pruned with a chain saw.

Controlled burning: Controlled burning is utilized to reduce slash concentrations or to reduce vegetative levels or control species composition. This practice involves the introduction of fire under controlled conditions to remove specified forest elements with little risk of catastrophic fire damage. Fire may be broadcast across entire areas, or may be utilized in specific spots or locations.

Cone collection: Cone collection involves the removal of cones from trees for purposes of producing tree seed for nursery production of desired tree species regeneration.

Cones may be collected by climbing individual trees and cutting cone-bearing limbs, or by falling individual cone-bearing trees, or by cone rake suspended from a helicopter.

Mechanical site preparation: Mechanical site preparation is the practice of preparing a site for planting, seeding, or natural regeneration. Mechanical site preparation methods include vegetative clearance and/or soil scarification by mechanized equipment such as a crawler tractor. This method may involve the burning of piles created by this activity. Other less intensive methods include clearance of individual planting spots through use of a chainsaw.

Habitat and Natural Resource Restoration and Protection: The JDSF includes twenty-three Special Concern Areas (SCAs), all of which will have either no harvests or harvest restrictions. SCAs comprise approximately 17,000 acres (35 percent) of the 48,652-acre Forest. A description of the SCAs is included in Appendix III of Management Plan. SCAs include unique habitat types, special status species habitat, unstable soils/slopes, watercourses, lakes, old growth groves, late-seral development stands, and research areas (DFMP, Chapter 3).

There are several prescribed limited silviculture buffers to sensitive land uses such as campgrounds, roads, trails, adjacent homes, State Parks, and recreational areas. These non-resource oriented SCAs result in ancillary habitat protection areas.

Within all areas of the Forest (inside or outside of SCAs), the JDSF Management Plan calls for increased habitat diversity including goals for mixed forests and maintenance of a hardwood component. Increased timber harvest restrictions are also proposed along watercourses, potential habitat for special status species, and for retention of snags and large woody debris (LWD) in stream channels (DFMP, Chapter 3). Prescribed burns, simulating natural conditions, may also occur for habitat management. (DFMP, Page 83).[1]

Some habitat restoration projects have potential to result in significant effects or to contribute to cumulative impacts. Each project is subject to the provisions of CEQA, and the detail of analysis generally corresponds to the level of potential impact. For example, although road decommissioning projects or woody debris enhancement projects are generally considered to produce a long-term environmental benefit, there is also potential for short-term environmental effects. An environmental analysis is conducted for these types of projects.

Habitat restoration projects include both terrestrial and aquatic habitats, and are often accomplished through the use of other associated activities such as timber harvest, research and demonstration projects, and road decommissioning, etc. The most common forms of habitat restoration utilized recently have included proactive road decommissioning (to restore the natural setting and stream channel network), use of silvicultural activities (to accelerate the production of specific habitat elements and to

[1] Page references to the DFMP refer to the electronic version (PDF) posted at the Board's website: http://www.bof.fire.ca.gov/pdfs/jdsf_mgtplan_master%203b.pdf.

accelerate habitat development), and addition of large woody debris to streams (to enhance the ecological function of aquatic habitats).

For further discussion, refer to Section VII.6 (Biological Resources).

Recreation Use: The JDSF Management Plan calls for modest increases in recreational uses and facilities. These generally include improvements to existing campgrounds, trails and access roads, and development of small new accessory facilities, such as trails, adjacent to existing recreational areas. Consideration is also being given to the reopening certain historically used campsites. (DFMP, Pages 76 to 78)

Primary recreation activities at JDSF are camping, hiking, picnicking, biking, driving, horseback riding, swimming/wading, and hunting. Special events are also permitted at JDSF such as equestrian and bicycling events. (DFMP, Pages 33 to 35)

Recreation activities also include maintenance and use of existing, improved recreational facilities. These include the Camp 20 Highway Stop, which is a rest area located off Highway 20 that is owned and operated by JDSF. These also include fourteen campgrounds and various trails. In 1999, there were over 12,200 days of use by campers. It is estimated that day-trippers account for about 50,000 visitor-days annually (DFMP, Page 26). For the purpose of the EIR, total annual use is estimated at 61,000 visitors.

The maintenance, construction, and improvement of recreational facilities are subject to environmental planning and review processes, the detail and scope of which coincide with the level of potential impact. Normal maintenance of facilities is generally very low impact, and often provides for an increase in the level of environmental protection (e.g., installation of drainage on a hiking trail). Other relatively minor maintenance activities may include repair or replacement of tables, barbecue pits, and vault toilets, surface rocking of vehicle parking areas, and incidental removal of dead or dying trees.

Projects involving a potential for significant impact may include construction of a new campground or a new hiking trail system. Although new campgrounds are not anticipated at this time, in these cases, the proposal would entail a detailed plan, an environmental analysis, and compliance with applicable rules and regulations (e.g., ESA, Fish and Game Code).

Recreation includes all legal activities conducted by the public on Jackson Demonstration State Forest including the associated construction and maintenance activities, including the following:

- camping and picnicking
- hiking
- horse-back or bicycle riding
- swimming and wading
- refuse and sewage collection and treatment
- water collection, treatment, storage, and supply

- campground, picnic, and trail construction and maintenance
- hunting, trapping, and shooting.

Recreational activities that involve the gathering and removal of plants or materials (e.g., mushroom gathering) typically require permits and are discussed in the section below on harvest of other forest products.

Camping: Camping is allowed on the Forest in designated camping areas. Camping areas include individual sites and group sites. The Forest provides pit toilets, fire pits, picnic tables, and refuse containers at or near each camping area. Camp hosts may occupy central locations in the vicinity of campsites.

Hiking: Hiking is allowed in all open areas of the Forest, including on trails, on roads, and cross-country.

Horseback and bicycle riding: Horseback and bicycle riding are allowed in all open areas of the Forest, including on specified trails, on roads, and cross-country.

Swimming and wading: Swimming and wading are allowed in all watercourses within open areas of the forest.

Refuse and sewage collection and treatment: Refuse containers are provided near all camp and picnic sites on the Forest. Refuse containers are periodically emptied and the refuse is transported to central collection sites or county refuse facilities. Pit toilets are periodically pumped and the sewage is transported by contractors to county or city sewage treatment facilities.

Water collection, storage, treatment, and supply: JDSF public camp and picnic sites do not have water supply facilities. Water for uses such as conservation camps and Mendocino Woodlands is collected, stored, treated and supplied to specific designated facilities on and off of the Forest. Water is taken from springs and watercourses in various locations across the Forest.

Campground, picnic area, and trail construction and maintenance: Campgrounds are occasionally constructed and closed, as are picnic area facilities and hiking and riding trails. Campground construction may include management or removal of live and dead vegetation, grading of soil surfaces, and installation of fences, barricades, access roads, and parking areas. Pit toilets also may be constructed. Trails are typically excavated by hand or by mechanical means such as a backhoe, tractor, or small excavator.

Hunting, trapping, and shooting: JDSF is utilized by the public for legal hunting, trapping, and shooting activities. All hunting and trapping must comply with applicable state and federal law.

For further discussion, refer to section VII.14 (Recreation).

Public access and utilities: The vast majority of road construction, reconstruction, or decommissioning activity conducted on the Forest is pursuant to a THP and the accompanying environmental analysis for the site and surrounding area. In the event that road construction, reconstruction, or decommissioning not associated with a THP is anticipated, the specific project would be subject to the provisions of CEQA and all other

applicable rules and regulations. Over the past 20 years, most road construction, reconstruction, or decommissioning has occurred pursuant to the THP process. However, several road decommissioning projects, generally viewed as environmental improvement, have been conducted outside of the THP process. These projects have incorporated an environmental review pursuant to CEQA. The DFMP also incorporates a Road Mangement Plan, which is discussed below.

Road maintenance is a routine and on-going activity within JDSF. Most road maintenance activities are designed to improve environmental conditions or to prevent environmental damage. The provisions of CEQA apply to road maintenance activities, as do all other applicable rules and regulations.

Most public utilities conduct their own maintenance activities, and their own site-specific environmental review. If timber is harvested for commercial purposes, the projects are subject to the provisions of the Forest Practice Rules, the THP preparation and review process, or the exemption and conversion exemption processes.

Public access and utilities activities include all roads, trails, and public utilities constructed, operated, and maintained on the forest for purposes of maintaining public access or public utilities. The following are elements of public access and utilities:

- power transmission lines
- water supply lines
- road construction and maintenance
- road and crossing decommissioning (pro-active road abandonment)

Power transmission lines: Power transmission lines exist in various areas of the Forest. These lines are maintained by various entities, including utility companies. Maintenance may include, but is not limited to, clearance or control of vegetation, repair and replacement of lines, poles, and other appurtenances.

Water supply lines: Water supply lines exist in various areas of the Forest. These lines are maintained by various entities, including public utilities, CDF, and other private entities. Maintenance may include, but is not limited to, repair or replacement of pipes and pumping equipment, intakes, and access trails and roads.

Road construction and maintenance: Road construction and maintenance for public access is similar activity to that which occurs in conjunction with timber harvest and management activity.

Road and crossing decommissioning: Roads and crossings, particularly those constructed long ago when timber was yarded down-slope to areas near streams, are proactively decommissioned to restore these areas and to reduce the potential for long-term sediment production, slope instability, and aquatic habitat damage. It is also desirable to let this former road area re-vegetate to stabilize soils and to create a more natural setting that is beneficial to wildlife and more aesthetically pleasing.

Harvest of Other Forest Products: The DFMP (as with the current plan) permits the harvest of minor forest products such as salvage saw logs, poles, split products, greenery, mushrooms and firewood. These uses are subject to restrictions and are

generally limited to low-intensity activities. Hunting also is allowed in designated areas subject to all California Department of Fish and Game regulations (DFMP, Page 77).

The collection of minor forest products, and the salvage of some types of commercial forest products, depending upon the scope of activity, are generally exempt from the requirement to prepare a Timber Harvesting Plan, but under certain circumstances may be subject to the provisions of CEQA and all other applicable rules and regulations. Commercial salvage operations are generally conducted after a natural event such as a large windstorm, or extensive insect or disease attack, weakens or kills a substantial volume of timber. These operations are subject to the provisions of the Forest Practice Rules, including the filing and review of THPs or exemptions to the THP process.

The collection of other minor forest products is generally dispersed and minor in scope, and to be conducted pursuant to the provisions of this EIR. Firewood collection is generally associated with a timber operation, and limited to the collection of dead and down material created by the operation and in close proximity to roadways and landings.

Minor forest products are collected, harvested, and transported on JDSF. The primarily activities associated with minor forest products include the following:

- salvage of some types of timber products
- gathering of plants and fungus (mushrooms)
- firewood, burls and poles.

Salvage of timber products: Dead and dying trees, windthrown trees, broken tops and trunks or trees are periodically salvaged from the forest. This salvage activity is similar to timber harvest and transport operations.

Gathering of plants and mushrooms: Permits are issued to the public for purposes of collecting whole plants or parts of plants (e.g. cones, branches, and ferns). Permits are also issued for the collection of fungi fruiting bodies (mushrooms).

Firewood, burls and poles: Permits are issued to the public for purposes of cutting, collecting, and transporting firewood, tree and root burls, and poles (small diameter tree trunks).

Fire Protection: The JDSF Management Plan proposes the development of a comprehensive Fire Protection Plan with provisions for shaded fuel breaks, fuel thinning, prescribed burns, and creation of improved water storage or collection areas, and helispots (DFMP, Pages 81 to 83).

Fire hazard reduction projects are subject to the provisions of CEQA and all other applicable rules and regulations. Many fuel reduction projects can be conducted pursuant to a THP. However, those conducted outside of the THP process are subject to environmental planning, review, and compliance with other codes and regulations, such as the endangered species act, the Fish and Game Code, and the applicable Water Quality Basin Plan. This type of project may include a reduction in live and dead fuel loading, either by broadcast burning or by mechanically treating or removing non-

merchantable vegetation. In some cases, mechanically treated materials are piled and burned on site.

Fire protection activities include:

- fire hazard reduction practices
- pre-suppression activities
- fire suppression activities.

Fire hazard reduction practices: Fire hazard reduction practices include controlled broadcast burning or other physical reduction of vegetation and forest debris to reduce fuel loading in the forest. Other hazard reduction practices include roadside vegetation clearance or control, fuel break construction, lopping of slash, and snag removal.

Pre-suppression activities: Pre-suppression activities include water diversion for purposes of water storage for fire fighting purposes, development of water drafting holes or ponds, and access road maintenance. Road maintenance for purposes of pre-suppression, public access, and timber management may include mechanical, chemical, and biological control of roadside vegetation. Species that may be controlled include Scotch broom, French broom, pampas grass, ceanothus, tanoak, coniferous species, grasses, etc. Mechanical control may include grading, hand cutting or pulling, use of a "brush buster"-type mechanical device, burning, steaming, etc. Biological control is being investigated for some selected invasive species. Mulching, encouragement of overstory shade, and establishment of desirable native species are also viable methods for maintaining an open and passable road system.

Fire suppression activities: These activities include, retardant drops, fire line construction (hand and mechanical), helicopter landing zone construction, water drops, water drafting, fire camp activity, snag removal, and fire line and road drainage and maintenance.

Pest Management: Forest pest control measures are proposed to control significant outbreaks. Actions are determined on a case-by-case basis. The JDSF Management Plan proposes an integrated pest management plan which emphasizes prevention and provides cultural, mechanical, chemical, and biological pest control alternatives (DFMP, Page 84).

For further discussion, refer to section VII.6.4 (Forest Protection).

Vegetation Control: Noxious and invasive species will be controlled through replacement by native species, physical removal and, at times, through the use of herbicides, mulch, and other treatments. Similar vegetation control measures are also planned to manage roadside vegetation for safety and fire containment or prevention (DFMP, Pages 58 to 59).

Roads: New roads will be constructed, or existing roads reconstructed, to support harvest operations. Most road development will occur in the eastern third of the Forest. This area of approximately 15,000 acres was primarily tractor yarded between the

1940s and 1970s. The existing road system is concentrated along lower slopes and watercourses. Over the coming 30 years, it is anticipated that a new upper slope road system will replace the existing system in order to facilitate cable skyline yarding and/or helicopter yarding of the steeper slopes. In addition, certain older access roads were poorly constructed and contribute to erosion and sedimentation. Many of these will be upgraded or decommissioned. A Road Management Plan is proposed to provide an inventory and prioritization schedule for road decommissioning or, where roads are still needed for access, improved road maintenance and stabilization practices (DFMP, Pages 73 to 74).

For further discussion, refer to section VII.7 (Geology and Soils), section VII.10 (Hydrology and Water Quality) and section VII.15 (Transportation and Traffic).

Quarries: Continued use of some existing quarries will occur to obtain surface materials for on-site roads. New quarries are not contemplated; however, development of new quarries could be considered depending on future need. Any new quarry would be subject to separate environmental review when specific information is known regarding size and location.

Timber Transport (Yarding and Hauling): Timber will be moved from harvest areas to trucks by ground-based (tractor) yarding on mild to moderately steep slopes, cable yarding on steeper slopes, and limited helicopter yarding for sensitive-soil areas or inaccessible areas. Log landings would be graded in specified areas for staging of loaders, haul trucks, and other equipment and materials, including fuels (DFMP, Page 72-73).

For further discussion, refer to section VII.6.3 (Timber Resources).

Monitoring and Adaptive Management Program: The Plan proposes a Monitoring and Adaptive Management Program (DFMP Chapter 5). “Monitoring” is the process used to evaluate progress toward the Plan’s stated goals. “Adaptive management” denotes the management strategies that will be implemented if analysis of monitoring results indicates that resource conditions begin to deviate from these goals. Measurement of the parameters included within the monitoring program (e.g., tree and stand characteristics, instream channel conditions, nest site productivity,) is done in such a way as to not result in environmental impacts. In some cases, (e.g., trapping and counting downstream juvenile migrant salmonids), state or federal permits are necessary.

Where monitoring and analysis indicates that a change in practices is needed in order to meet the Plan’s goals, the wide range of activities discussed in the other subsections of section III.3.2.1 essentially provides the menu of actions that could be taken as adaptive management steps.

3.2.2 Potential Off-site Actions

Off-site Timber Transport and Recreational Travel: Logging trucks would utilize the surrounding public road network for hauling logs to processing facilities as determined by the contract operator or buyer. Private off-site roads could be used subject to needs and agreements from the access right holders.

Recreational travel is also significant. Nearly half of the 12,200 camping days annually are attributed to Mendocino County residents.

All roads generally feed Highway 20 (which runs east/west through the Forest), Highway 1, and Highway 101. Highway 20 also connects to Interstate 5 at Williams located approximately 95 road miles east of Willits. County Roads also receive traffic generated from JDSF (DFMP, Pages 26 and 35).

Adjacent Land Purchases: The JDSF Management Plan considers purchases and trades to acquire private in-holdings and areas adjacent to JDSF. These are subject to funding availability and negotiations with landowners. Priority is given to areas that enhance Forest protection or research needs. Important considerations are watersheds, unique habitats, access, fire protection or buffer areas (DFMP, Pages 86 to 87). Such purchases or trades could result in the following activities:

- Conversion from a non-resource use, such as rural residential, to a resources use, such as timber production, timber buffers or habitat conservation.
- More effective research, demonstration, and conservation through better control over area conditions
- Conversion to any other use consistent with JDSF Management Plan

Application of Demonstration Programs: The primary goal of the JDSF is to conduct research and demonstration programs for the benefit of all forests in the State, particularly those in coastal areas with similar forest structure and environmental characteristics. From either a biological or a regulatory point of view, economical forest management now, more than ever, requires conservation or protection of environmental resources; therefore, along with more conventional timber productivity assessments, environmental research is becoming increasingly important to economic timber production.

The Forest Service has a significant land base in all major forest ecosystem types except for coast redwood. JDSF represents the most significant coast redwood acreage dedicated to long-term forest research. Results from research on JDSF are the best option to inform the improvement of forest practices on private lands (85% of coast redwoods is in private ownership–this high percent is also unique when compared to other forest ecosystem types).

Many demonstration and research activities, to the degree they are effectively implemented and the information is disseminated, will undoubtedly result in actions to

improve environmental resource conservation and protection on lands outside of JDSF. These beneficial off-site actions, although difficult to quantify, are also considered as part of this EIR.

Chapter 4 and Appendix IV of the JDSF Management Plan provide a detailed discussion of active and planned research/demonstration programs (also refer to "Research and Demonstration" in the "On-site" discussion above).

4. ACTIONS NOT EVALUATED AS PART OF THIS EIR

Two conservation camps housing inmates of the State correctional system (Parlin Fork and Chamberlain Creek) are located within JDSF. CDF has authority over these areas, which total 43 acres. JDSF has no management authority over these camps and they are not within the scope of the JDSF Management Plan, other than limited discussion regarding the impacts of forest management on camp operations.

The Pacific Gas and Electric Company maintains a power line right-of-way running through JDSF generally parallel to Highway 20. In addition, California Department of Transportation (Caltrans) maintains the Highway 20 right-of-way. These areas are not within the control of CDF or the Board. While the utilities and the Highway are part of the area setting, PG&E or Caltrans actions regarding these facilities are not within the scope of the JDSF Management Plan.

Several off-site, indirect actions related to the processing of JDSF forest products will also occur (i.e., use of new or existing mills, hauling and use of lumber, etc.) The location and types of action vary based on market conditions, desires of the timber sale buyers and operators, and the type of product being processed. These linked but distantly related actions are too speculative to warrant evaluation pursuant to CEQA (CCR §15064).

5. Economic, Social, and Community Effects

CCR § 15124(c) states that the project description in an EIR should include a description of the project's "economic characteristics". As the principal economic factor is revenue from timber harvesting, the analysis of the economics for the proposed project and the alternatives can be found in the section VII.6.3, Timber Resources.

In addition, the CEQA Guidelines state that lead agencies may discuss a project's social and economic effects in an EIR but may not treat them as significant effects on the environment (CCR 15131). Economic or social changes resulting from implementing a project may be used in determining that other physical changes are significant if the lead agency can clearly establish the "chain of cause and effect". However, the Board, in analyzing the proposed project and alternatives, has not found any significant physical changes that result from social or economic effects.

CCR § 15125 requires a description of the physical environmental conditions in the vicinity of the project from both a regional and local perspective. For this EIR, the relevant regional settings for examining economic and social issues vary from the entire California redwood region to the North Coast, depending upon the issues.

Jackson Demonstration State Forest is the largest and oldest state forest. It is located in California's redwood region (ranging from Monterey County to across the Oregon border), which has been a timber producer of regional, national, and international significance since the 1800s (Williams 1989). While the redwood region's forest cover has been reduced to make way for agriculture, residential development, and major infrastructure projects, the current young growth based forest sector remains a significant pillar in the economic, social, and environmental fabric of the North Coast counties of Sonoma, Mendocino, Humboldt, and Del Norte. In addition to the changing mosaic of forest structure and stream conditions across the region, the use and management of public and private forestlands also will have economic, social and community effects.

Regional conditions and trends with regard to forest management, recreation and open space attributes, and the pattern of land conversion from forests to agricultural, residential, and commercial uses will all have impacts on workers, their families, and their communities. The purpose of this section is to describe the regional trends that are relevant to the intent, operation, and effects of a demonstration state forest.

5.1 Overview of the North Coast Redwood Region and the Role of JDSF

The large forest industry holdings in the redwood region represent much of the unfragmented areas of natural vegetation in a region with limited federal forestlands. The many smaller non-industrial forest land ownerships cover nearly as much area as the industrial holdings and account for most of the forest land that could be relatively easily converted to agricultural or residential uses. Many of the larger lots within rural residential areas and on the outskirts of denser residential and commercial areas also provide considerable tree cover and wildlife habitat, even if the forest habitats are fragmented. All of these forests provide unique open space values and recreational opportunities between the rugged coastline and the drier interior valleys and mixed forests and rangelands.

JDSF offers many opportunities for hiking, hunting, fishing, horse back riding, mountain biking, recreational driving, and primitive camping, thus complementing the numerous parks developed around old growth stands of redwoods and Douglas-fir that dot the region. Many of these more dispersed recreational offered by JDSF are not allowed in parks where they would interfere with the preservation goals or could conflict with specific areas with high intensity use, such as the well visited groves and river banks.

From an employment perspective, forest management and related employment provide a substantial proportion of the better paying jobs available outside of the cities on the

North Coast. The remaining sawmills and wood remanufacturing plants still make up a significant component of the regional manufacturing base. In addition to the direct employment created by these manufacturing jobs, the businesses also generate demand for many locally produced goods and services.

As the region completes a transition from an area dominated by an old-growth based forest industry to a more diversified economy and a new set of social and economic opportunities, it is worthwhile to identify the larger local and regional framework within which a demonstration state forest operates.

The legislated intent for Jackson Demonstration State Forest foreshadowed the importance of managing young growth forests, long before the harvest of young growth trees surpassed that of old growth during the 1980s. Public Resources Code section 4631 states:

> It is hereby declared to be in the interest of the welfare of the people of this state and their industries and other activities involving the use of wood, lumber, poles, piling, and other forest products, that desirable cutover forest lands, including those having young and old timber growth, be made fully productive and that the holding and reforestation of such lands is a necessary measure predicated on waning supplies of original old growth timber.

More recently, the California Timberland Productivity Act of 1982 (Public Resources Code § 51102) establishes one of its goals to "discourage premature and unnecessary conversion of timberlands to urban and other uses."

Non-industrial timberland owners manage approximately half of the private forestland in the North Coast region. Nearly all of these forests were initially harvested decades ago and have been regenerated. Unlike the industrial timberland owners who have permanent staff to manage the land and may have strong financial interests in related sawmills, remanufacturing plants, and wholesale timber businesses, many of the non-industrial forest land owners are less dependent upon long term forest management, and are not very knowledgeable in the complexities of managing forests. The demonstration mandate of the state forests includes demonstration of the long-term physical and financial viability of managing young forests. If the values of long-term forest management are not demonstrated to owners of small to mid-sized forest tracts, there is greater potential for these lands to be converted to other uses, and the economic, social, and environmental impacts of expanding forest fragmentation could be magnified across the region.

5.2 THE TRANSITION TO A YOUNG GROWTH REDWOOD ECONOMY

Over the past twenty years, the redwood region has nearly completed the transition to a forest management economy based upon young growth forests. As shown in Figure

III.1, the harvest of young redwood surpassed old-growth in the mid 1980s and currently makes up nearly all of the total redwood harvest.

After the mid 1980s, old growth harvests declined very rapidly and harvests shifted to young growth. Compared to alternative land uses such as residential, grazing and vineyards, young growth forestry can still provide a flow of valuable wood products, local employment, open space, wildlife habitat, and watershed protection values. However, alternative land uses have the potential to provide higher financial benefits to landowners.

Compared to other regions of California with significant federal forest holdings and generally less productive sites, the North Coast region has the highest total privately owned timber volume and the highest involvement by the non-industrial forestland owner. Figure III.2, extracted from the 2003 Forest and Range Assessment, compares forest industry by ownership class for the major regions of California.

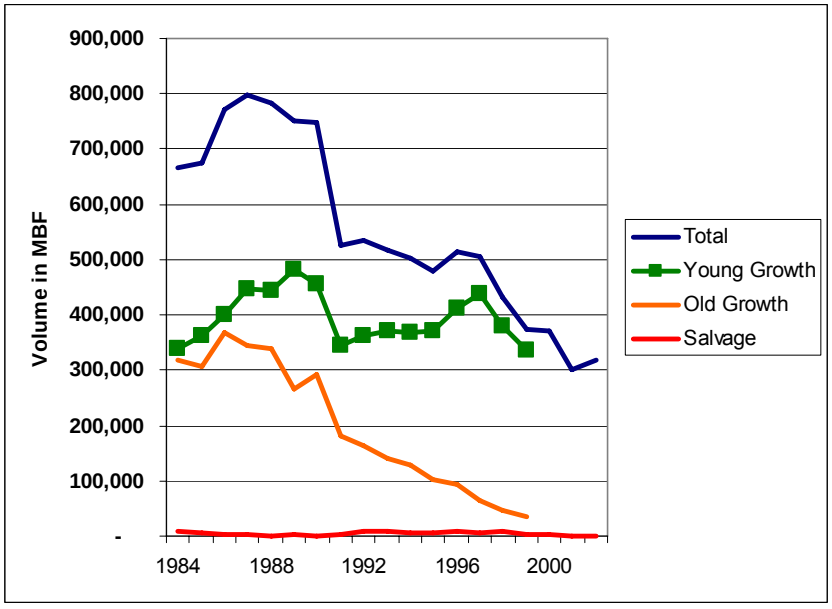

Figure III.1. Total, Young, Old, and Salvage Harvest Trends for Redwood, 1984-2002.
Source: Board of Equalization 2004

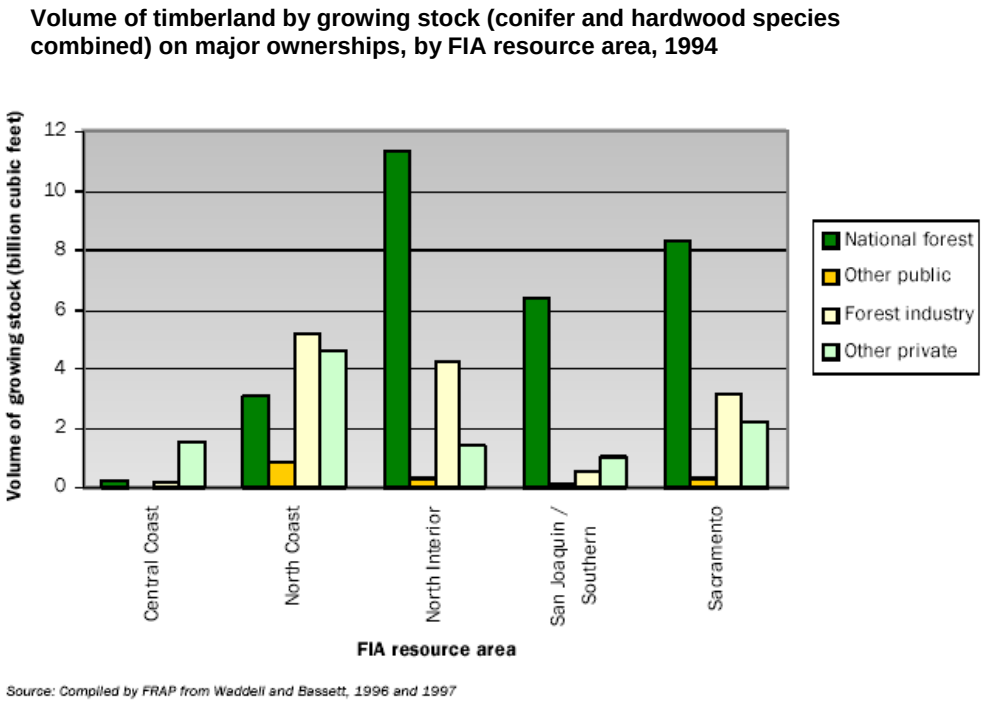

Figure III.2. Timberland Growing Stock and Ownership by FIA Region.

5.3 North Coast Industrial and Non-Industrial Forest Inventory and Sustainability

5.3.1 Forest Inventory

Table III.2 provides a more detailed description of the industrial and non-industrial private forest (NIPF) owners of the North Coast, in terms of some of the basic characteristics of their timberland inventories. NIPF timberlands have lower total per-acre inventories (3.45 versus 3.69 thousand cubic feet/acre) and overall forest growth rates (2.7% versus 3.6%) than industrial lands. Additionally, a consistent pattern across the region is that NIPF owners' lands have higher stocking rates of hardwoods (1.49 versus 1.01 thousand cubic feet/acre) and lower stocking rates of softwoods (1.97 versus 2.28 thousand cubic feet/acre). The hardwoods generate little if any revenue and take up growing space that could be occupied by higher value conifers. In addition to increasing the overall financial profitability of forestlands, an increase in conifer forest components within these forests, especially along watercourses would improve fish and wildlife habitats for many species.

Table III.2. Inventory Characteristics of Private Timberland of the North Coast.			
Variable	Total Private	Industry	Nonindustrial Private Forests (NIPF)
Timberland Acres	2,738,000	1,402,000	1,336,000
Total Inventory per Acre (thousand cubic feet/acre)	3.58	3.69	3.45
Conifer Inventory per Acre (thousand cubic feet /acre)	2.33	2.68	1.97
Hardwood Inventory per acre (thousand cubic feet /acre)	1.24	1.01	1.49
Conifer as Percent of Total	65%	73%	57%
Forest Growth Rate	3.2%	3.6%	2.7%
Source: Timber Resources Statistics for the North Coast, 1994, Waddell and Bassett			

5.3.2 Forest Sustainability: Current Growth Exceeds Harvest on Private Forest Lands

A key sustainability metric in any forest region is whether the net timber volume and/or forest land base is declining. Calculating the net status requires combining two different data sets: region wide harvest data available annually; and region wide forest growth data available from the decadal US Forest Service surveys. Figure III.3, from the 2003 Forest and Range Assessment, compares forest growth rates and harvest rates on private forestlands from the last published inventory (1984 to 1994). The figure shows that across the North Coast about three quarters of the growth is being harvested with the rest of the growth going into increased inventories. For the North Coast, it is probable that harvests exceeded growth before 1984, when old growth harvests were much higher. Since 1994, declines in harvest levels would suggest that inventories are increasing.

As long as harvests remain below net growth, overall forest inventories will continue to increase. However, if forest land is permanently converted from actively managed timberlands to other uses at a more rapid rate than was experienced during the 1984-1994 period, the relationship of increasing forest inventories at the regional level could change significantly.

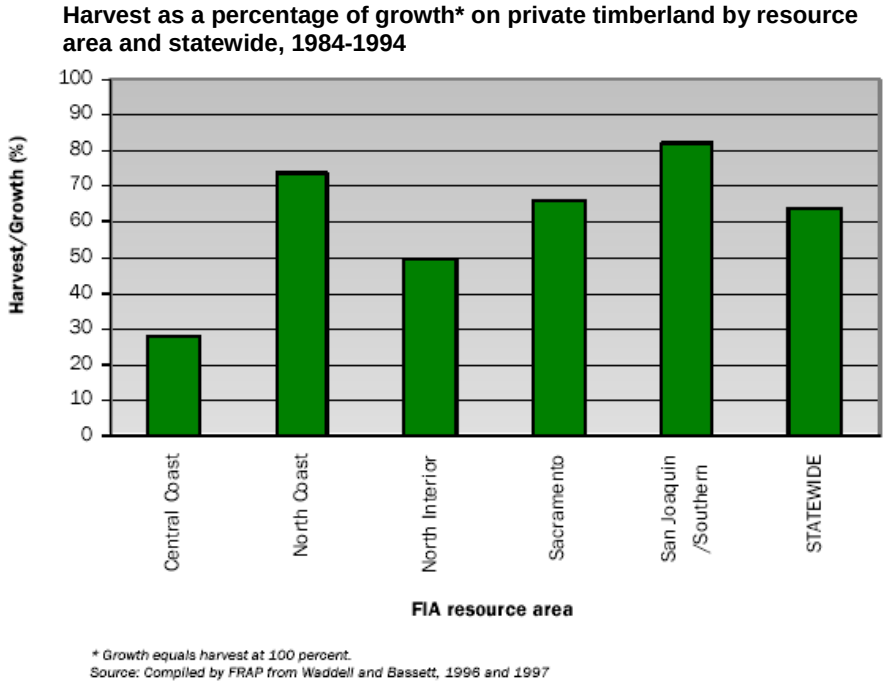

Figure III.3. Harvest as a Percent of Growth on Private Timberland, Statewide and by Region.

5.4 ECONOMICS OF THE TIMBER INDUSTRY

5.4.1 Harvest Levels

North Coast harvest levels have been declining since at least 1990 (Figure III.4). The recent decline of harvests from JDSF represents about one quarter of the overall decline in Mendocino County between 2000 and 2003. County harvest levels have increased somewhat since the low in 2001, but remain considerably lower than those of the late 1990s. As noted in the preceding section, the harvest levels during the 1984 to 1994 period were only about 75% of net growth. With post-2000 harvest rates only about half of the 1984 to 1994 period, harvest rates are now closer to 50% of net growth.

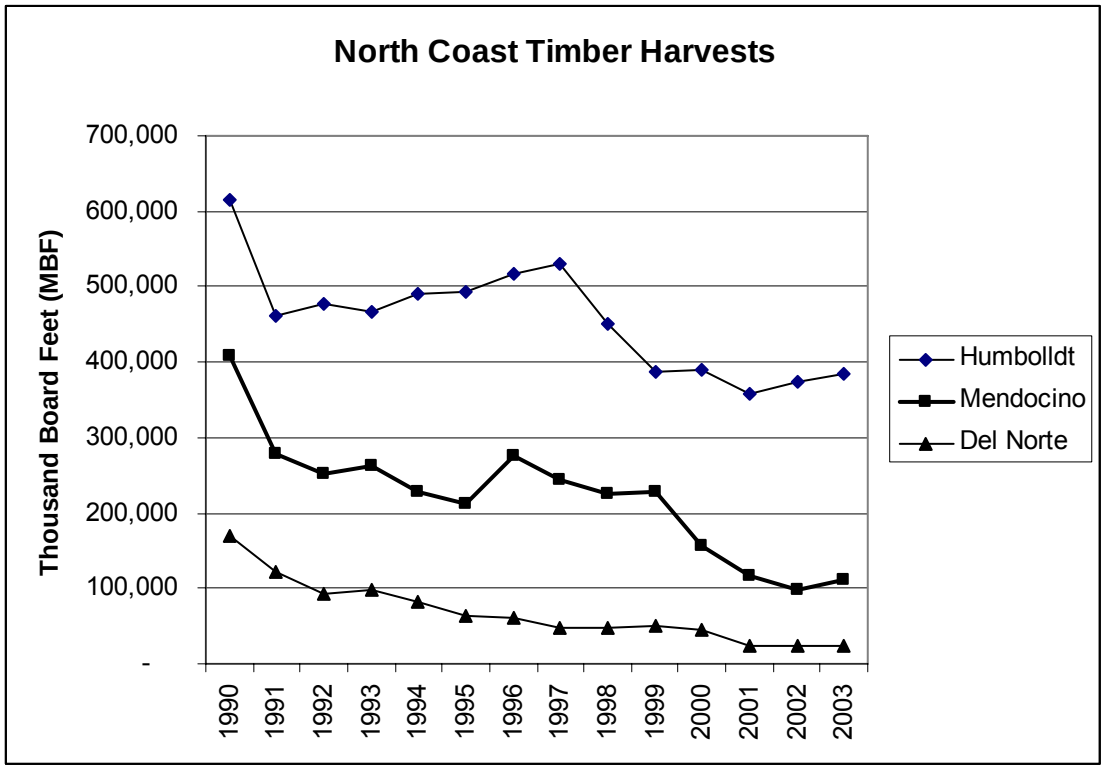

Figure III.4. North Coast Timber Harvest by County, 1990-2003.
Source: State Board of Equalization.

5.4.2 Redwood Timber Economy Linkages

The most traceable jobs associated with the timber industry are those within the sawmill and wood remanufacturing plants. Logging, trucking, forestry, and reforestation jobs at the county level are often lumped with broader employment groups and are much harder to track with readily available data from the state's Employment Development Department (EDD).[2] Figure III.5 illustrates the downward trend in sawmill and wood remanufacturing jobs that accompanied the declining harvests. Some of the sawmill and remanufacturing jobs in the region are now dependent on the import of logs from other counties, states or nations. In the long term, mills using imported logs will be at a cost disadvantage compared to mills closer the harvest areas.

[2] The recent shift from the Standard Industrial Classification (SIC) to the NAICS classification systems has added to the difficulty of tracking total employment and harvest relationships.

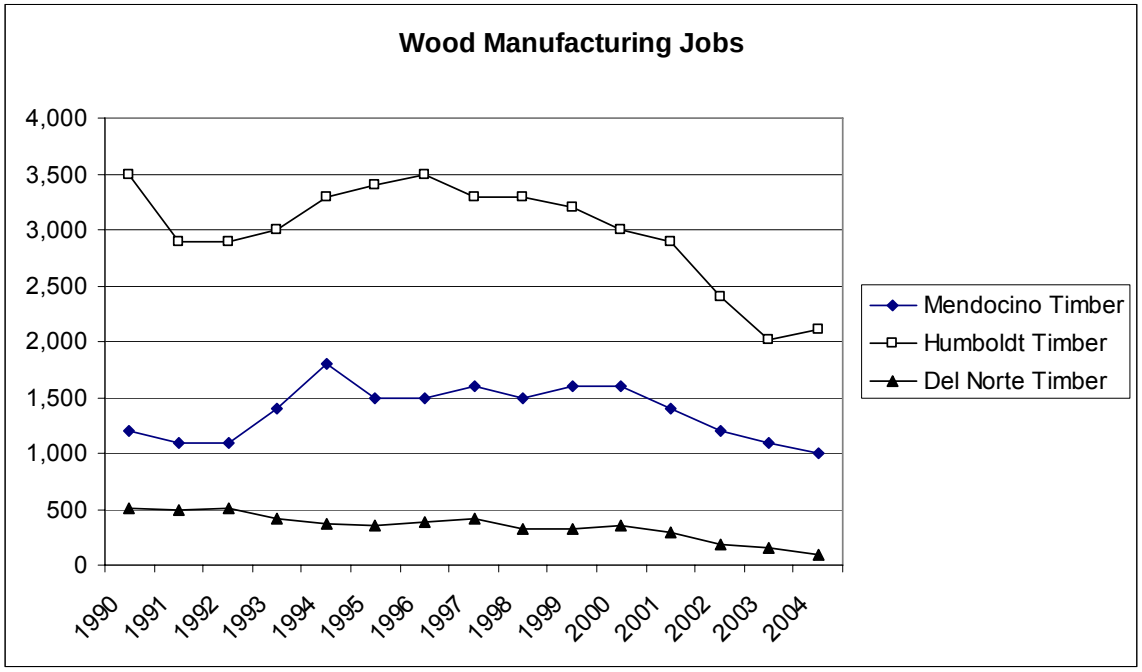

Figure III.5. Employment in Wood Manufacturing Jobs for the North Coast Region, by County, 1990-2004.

5.4.3 Estimating the Employment Impact of Changing Harvest Levels

In most cases, the decline in jobs is rarely as precipitous as the decline in harvest levels. The following two figures (Figures III.6 and III.7) illustrate the relationship between overall harvest levels and the inverse in labor productivity [jobs per million board feet (MMBF)] in Mendocino County and a comparison of labor productivity measurements for Mendocino and Humboldt counties. If sawmills are laid out to have a standard manufacturing process and a relatively fixed workforce, labor productivity will be high (a low job/million board feet ratio) when there is a high level of harvest going into the sawmill and low when there is a lower harvest input. Sawmills can maintain low levels of labor productivity for short periods of time but will eventually have to close if log supplies do not increase.

Figure III.7 shows that Mendocino County's jobs-to-county-harvest ratio diverges from Humboldt County's around the year 1999. This shift is due to a trend of importing logs from Humboldt County and the State of Washington to Mendocino County mills.

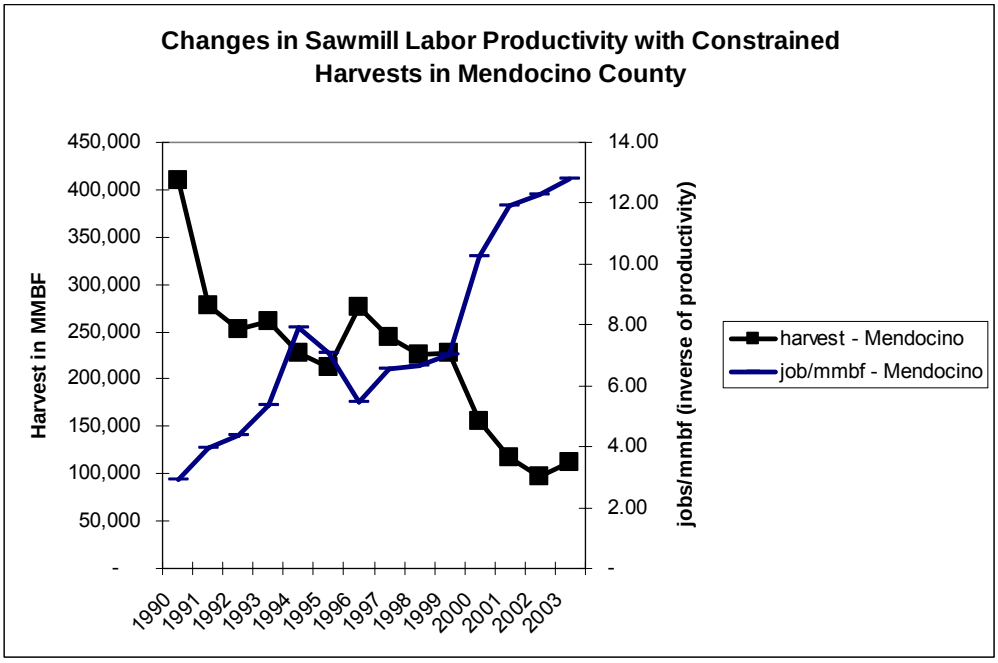

Figure III.6. Changes in Sawmill Labor Productivity for Mendocino County, 1990-2003.

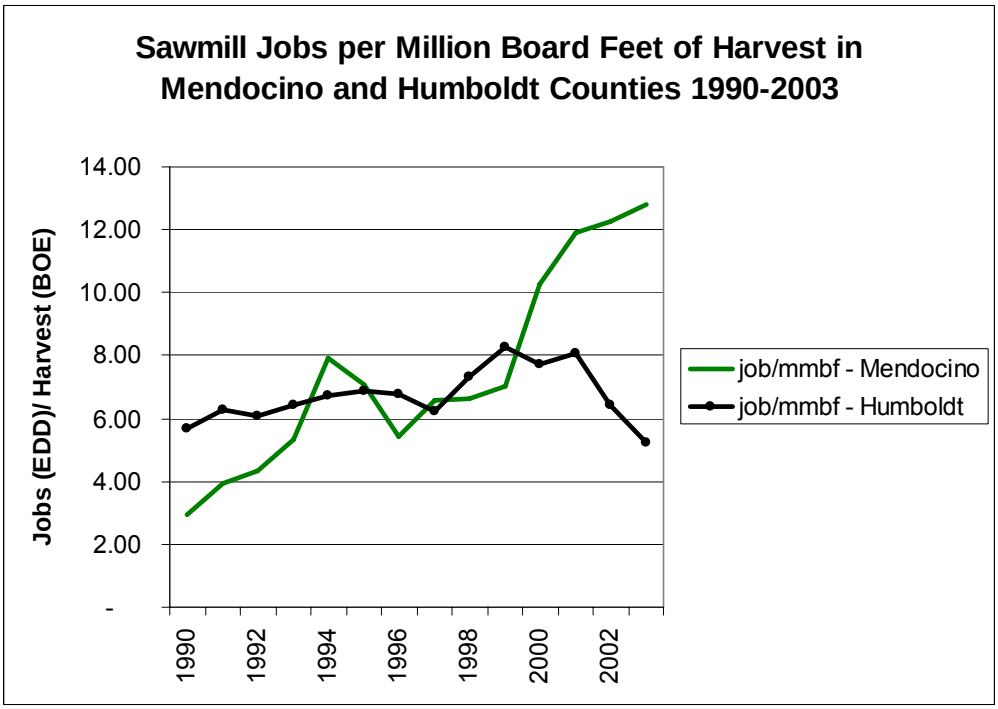

Figure III.7. Sawmill Jobs per MMBF of Harvest for Mendocino and Humboldt Counties, 1990-2003.

5.4.4 The Economic and Social Impacts to Displaced Timber Workers

It has often been asserted that any displaced timber workers can easily be absorbed in equal or better paying jobs when the regional employment is growing. It is important to test this assertion to better understand the broader employment and social impacts of changes in forest management practices. The large decline in federal timber harvests in Oregon during the 1990s resulted in a large decline in the number of workers in the wood products industry. In 2002, research economists provided more detail on what happened to individual workers. Since Oregon experienced an increase in total jobs during the 1990 to 1998 period, primarily driven by growth in the urban areas near Portland, it was often assumed that ex-timber workers also benefited from the statewide economic growth. By tracking all the individual workers, Ted Helvoigt at ECONorthwest and a team of researchers were able to provide a more realistic history. (Helvoigt,Ted; Adams, Darius, and Ayre, Art. 'Employment Transitions in Oregon's Wood Products Sector, Journal of Forestry, June 2003, p 42-46. http://www.econw.com/pdf/emp_trans.pdf)

Helvoigt and others documented that more than half of the 60,000 timber workers left Oregon's wood products industry between 1991 and 1998. About 17,000 disappeared from the work rolls in Oregon completely—either by leaving the state, retiring, or remaining unemployed. About 18,000 ex-timber workers were able to find other jobs in Oregon. About one-third of these workers had to relocate to the more expensive urban areas of the state. Those who secured manufacturing, construction or transportation jobs were able to maintain their wages, but the majority of the workers had to take jobs in the service and retail sectors at much lower wages. For these workers, their post timber wages were roughly what they had earned almost 10 years before they lost their timber sector jobs. While the statewide economy grew to record levels of income and employment during the 1990s, the researchers concluded that the workers forced out of the timber industry did not share in the bounty. Most of the displaced workers stopped working in Oregon, took much lower paying jobs, or had to relocate to distant urban areas. The experiences in Oregon are also relevant to California's North Coast region where similar declines in the timber sector occurred during a period of overall regional job growth.

5.5 Economics of Wildland Recreation in the North Coast Region

Subsequent to the expansion of Redwood National Park in the 1970s, the increase in park visits and related tourism was anticipated to reduce the negative employment impacts of reduced timber harvests from sites transformed into parks as well to soften impacts for the region as a whole. The growth of private businesses in the recreation and related tourism throughout the region has been significant, but has not proceeded as the simple replacement of one industry by another.

The 2003 background papers for the Mendocino General Plan point out that most of their local recreation and tourism industry is not in close proximity to the forest areas of

the county. Rather, it is focused primarily along the coast and the Highway 101 corridor. Increased business activity along Highway 101 also has been fueled by the recent expansion of Indian casinos. The four Indian casinos in Mendocino County have over 1400 slot machines and nearly 150,000 square feet of gambling and entertainment areas. For the forest areas between the coast and the interior highway corridor, the tourism and recreation activities consist mainly of day travelers and campers pursuing different activities on multiple ownerships (Pacific Municipal Consultants. January 2003. Background Report for the Mendocino County General Plan Update. Economic Development chapter).

Within the forest areas, state parks with high use levels and strict protection and restoration mandates limit activities such as horseback riding, off-leash pets, mountain biking, shooting, hunting, and primitive camping. The larger demonstration state forest as well as forests managed by the federal Bureau of Land Management and the USDA Forest Service typically allow for a wider range of recreational activities that complements the more restricted range of activities allowed at state parks.

While consistent park and forest visitation data are not kept for all locations, it appears that the percentage increase in redwood park tourism has not matched increases in statewide tourism. The following data suggest two possible factors for the divergence between redwood-specific tourism and overall tourism. Figure III.8 depicts use trends for 16 State beach parks and 19 State redwood parks in Mendocino, Humboldt and Del Norte Counties between 1991 and 1999. While both types of parks had millions of visitors, the redwood parks experienced a 14% decline while beaches experienced a 6% increase.

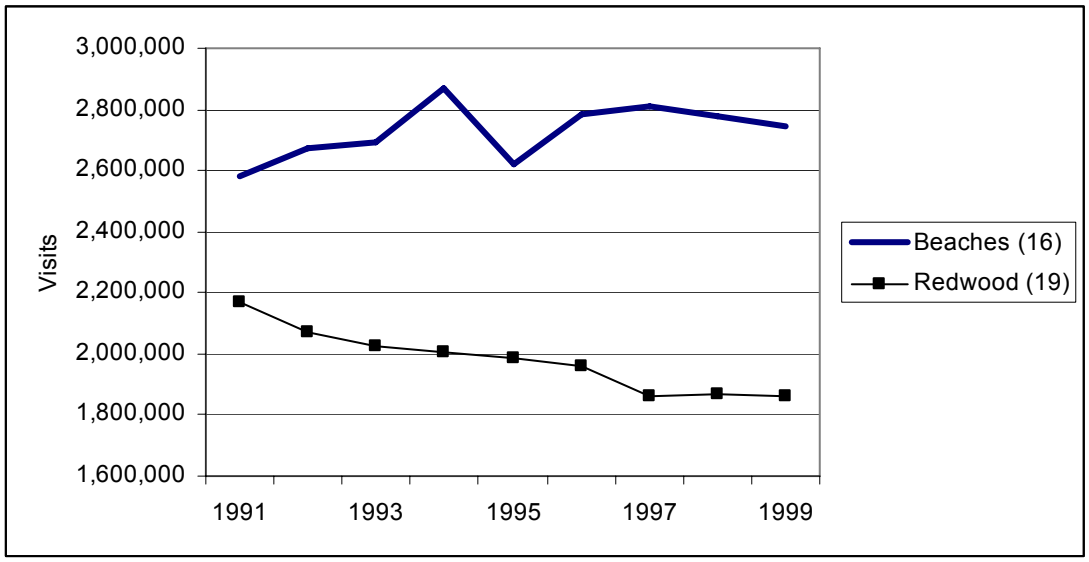

Figure III.8. State Park Visits to Redwood and Beach Parks in Del Norte, Humboldt, and Mendocino Counties. Source: FRAP 2003b.

Table III.3 compares use data for a number of redwood parks across the larger redwood region. One of the most significant relationships is the much higher use levels in the parks in and around the populated San Francisco Bay Area and the decline in use intensity for more distant sites–-even those sites with the most majestic redwood groves. These use trends correspond to California-wide trends of increases in day use of parks near metropolitan areas, along with flat use patterns for more remote parks. From an economic perspective, the major implication is that visitation and tourism related employment for redwood forests will continue to be an important aspect of our redwood forests but will probably not be an economic growth sector for areas not close to the San Francisco Bay Area. By comparison to these parks, the 48,650-acre JDSF receives a roughly estimated 61,000 visitors per year, or about 1.3 visitors per acre.[3] This is about one-fourth of the visitation of the least intensely visited park, Redwood National and State Park. The JDSF use rates are similar to recreational use rates on the Mendocino National Forest (FRAP 2003b).

Table III.3. Visits, Area, Use Intensity, and Distance from the San Francisco Bay Area for Major Redwood Parks.

Park	Acres	Annual Visits	Visits/Acre	Distance (miles) from San Francisco
Muir Woods	554	719,350	1,298	20
Armstrong Redwoods	752	991,622	1,319	80
Samuel P. Taylor	2,792	142,140	51	40
Henry Cowell Redwoods	4,316	361,801	84	50
Big Basin Redwoods	17,998	1,259,919	70	40
Jedediah Smith	9,891	194,666	20	130
Del Norte Coast Redwoods	6,370	60,439	9	380
Humboldt Redwoods	52,000	537,336	10	210
Redwood National and State Parks	78,077	408,126	5	340
JDSF	48,562	61,000	1.3	170

Data sources: Department of Parks and Recreation 2003, http://www2.nature.nps.gov/stats/.

The development of recreational opportunities beyond existing roads, minimally improved and maintained trails, and primitive camping opportunities requires considerable governmental expenditure for basic infrastructure and public safety. As governmental budgets have been squeezed at local, state, and federal levels, there also has been an increased use of fees to cover costs. Fees are rarer on state and federal forest ownerships, in part because much of the infrastructure and public safety requirements are often covered by the commodity production.

[3] CDF considers this visitation estimate very rough due to the lack of controlled entry points, entry fees, or visitor-counting system. Actual numbers could be much higher.

Although forests dominate the land cover of the North Coast region, their use does not dominate the wildland recreational economy. The recent update of the Mendocino County General Plan calculated that 58% of this economic activity was from overnight guests along the coastline and Highway 101, 21% was from day travelers who were also primarily visiting the coast or driving along Highway 101, 11% from campers who visit both the coast and the nearby forests, and 10% from visitors to friends and relatives. The range of recreational opportunities at state parks, located primarily along the coastline, as well as other state and national parks, state forests, and federal forests, are extensive and complement the coastline and highway-based recreation economy of the North Coast. The following sections will analyze the employment implications of potential changes in the recreation and tourism economy.

5.6 Alternative Uses of Redwood Lands – Fragmentation for Rural Residential Uses

Another relevant land use trend with large economic and social implications is the large increase in the area of redwood forests being converted to residential use. Table III.4 summarizes an overlay of 2000 Census block population densities within the Redwood Region. Approximately 17% of the total area is in census blocks where there is at least one house per 40 acres. While these housing densities will have limited impact on the number of trees per acre, they do signify a shift in land use away from unfragmented forest management towards a mix of forest management and residential land use. Nearly all of the residential lands are concentrated in four counties. The most unique county is Santa Cruz, where over half of all the redwood forests are part of the rural residential landscape. As Figure III.9 illustrates, the same pattern exists in the Russian River region of Sonoma County, between the towns of Mendocino and Fort Bragg in Mendocino County, and in the Humboldt Bay region of Humboldt County.

Table III.4. Year 2000 Census Based Analysis of Average Residential Parcels in the Redwood Region.

Total Acres Redwood Forest	County	Average Parcel Size Classes and Acreage based on 2000 Census Block Data				
		>40 acres	20-40 acres	5-20 acres	1-5 acres	<1 acre
541,959	Mendocino	490,717	33,233	16,573	1,426	10
424,216	Humboldt	356,786	36,987	25,751	3,287	1,406
114,252	Santa Cruz	48,697	5,795	52,233	6,351	1,176
93,482	Sonoma	64,114	15,538	9,590	3,976	264
123,501	Others	111,106	3,138	7,240	1,927	89
1,297,410	Total	1,071,419	94,691	111,388	16,966	2,945
	% Of total area	83%	7%	9%	1%	0.2%

Source: U.S. Census 2003

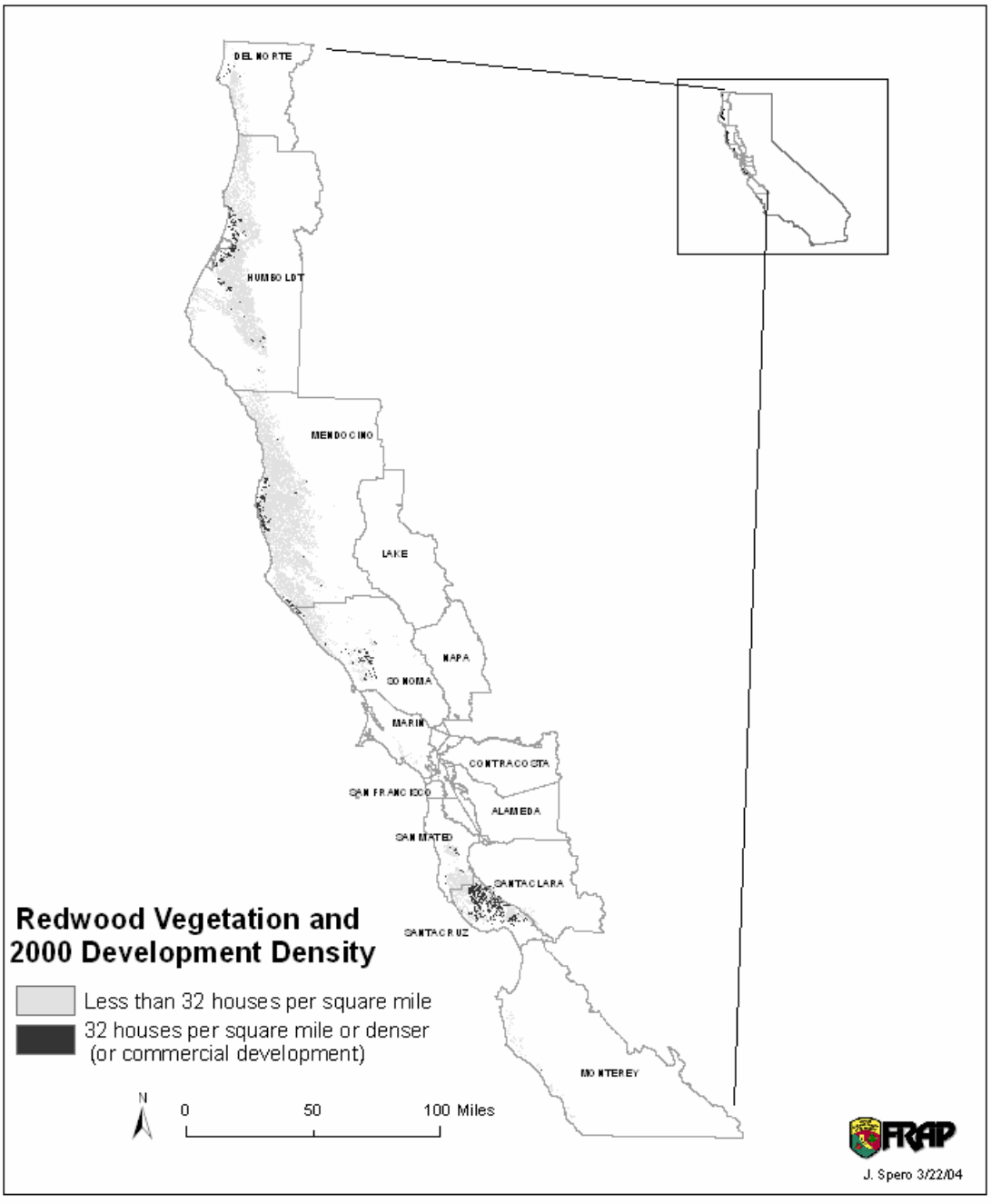

Figure III.9. Map of Rural Residential Development in the Redwood Region, 2002.

During the 1990s, a significant shift towards smaller lots occurred in four counties. Table III.5 shows increases (positive) and decreases (negatives) in the total acreage of parcels in various acreage size classes. While few acres reached urban densities of more than one house per acre, the total acreage that moved into the rural residential category of more than one house per forty acres is greater than the total acreage of new park acquisitions. Table III.6 depicts the same data as a percentage of total acres within the counties. Santa Cruz County had the largest percentage change, but the changes in the much larger county of Mendocino affected three times as many acres.

Table III.5. Change in Redwood Acreage at Different Housing Densities, 1990 to 2000.

Total acres Redwood Forest	County	Average Parcel Size Classes and Decadal Acreage Change based on 2000 Census Block Data				
		>40 acres	20-40 acres	5-20 acres	1-5 acres	<1 acre
541,959	Mendocino	-32,223	32,190	25	0	7
424,216	Humboldt	-13,504	11,658	1,502	-554	897
114,252	Santa Cruz	0	-12,311	12,244	-381	447
93,482	Sonoma	-3,170	991	1,611	568	0
123,501	Others	-54	-383	183	242	12
1,297,410	Total	-48,952	32,146	15,565	-124	1,364

Source: US Census 2000.

Table III.6. Percentage Change in Redwood Acreage at Different Housing Densities, 1990 to 2000.

Total acres Redwood Forest	County	Average Parcel Size and Decadal Percentage Change based on 2000 Census block data				
		>40 acres	20-40 acres	5-20 acres	1-5 acres	<1 acre
541,959	Mendocino	-6%	6%	0%	0%	0%
424,216	Humboldt	-3%	3%	0%	0%	0%
114,252	Santa Cruz	0%	-11%	11%	0%	0%
93,482	Sonoma	-3%	1%	2%	1%	0%
123,501	Others	0%	0%	0%	0%	0%
1,297,410	Total	-4%	2%	1%	0%	0%

Source: US Census 2000

From an economic point of view, the shift of forestlands to residential uses will generate construction jobs in the short term when homes are built and will provide for a dispersed population of new residents and workers. These trends will require more government services in terms of schools, fire protection, emergency services, and improvements to

road and utility infrastructure—all of which will need to be funded by greater property tax or fee revenue.

5.7 Overview of Basic and Non-Basic Sector View of Local Economies

Local economies can grow and prosper when they have strong basic economic sectors that can produce and sell goods and services to outside markets. Timber, agricultural products, manufactured goods and tourism are all examples of goods and services that bring revenue into the region. When these revenues are expended locally as wages or business purchases, they support a much larger number of local service jobs, both private and governmental. Retirees and other new residents bring investments and retirement funds from outside of the local area, which help to support additional local jobs. The diminished growth of the stock market since 2000 has reduced the scale of this type of personal income. The challenge of any regional economy is to have a diversified range of basic sectors to balance out cyclical changes.

Local jobs that involve commodities or services that are sold outside of the county or region have added benefits that flow from the fact that workers and the business that employ them spend most of their wages and a considerable fraction of business purchases locally. This generates additional local employment. The CASPO report (University of California 1994) estimated that there was one indirect job for every regional timber job in the Sierra Nevada. The FEMAT report, covering the region of the Northern Spotted Owl in California, Oregon, and Washington estimated 1.1 indirect jobs for every direct timber job. Stewart (1993) estimated 0.85 indirect jobs for every direct timber job based on county data before 1992. The huge loss of timber jobs is related to the protection and management of the northern spotted owl and the Federal Government's Northwest Forest Plan (60,000 jobs in Oregon alone). Unfortunately this change provided a massive test of the economic model estimates of the direct to indirect job relationship from a reduction in direct timber employment. The general conclusion was that every job lost in the timber industry would jeopardize approximately one additional job in other industries. (ECONorthwest, The Economic Impacts of the Proposed Siskiyou Wild Rivers National Monument, June 28, 2000. http://www.econw.com/pdf/siskiyouNM.pdf).

The survey data in Table III.7 are taken from the 2003 Occupational Employment Statistics (OES) survey for their North Coast region that includes Del Norte, Humboldt, Lake and Mendocino counties. The wages have all been updated to the first quarter of 2004 by applying the Employment Cost Index to the 2003 wages. Details of the methodology and revision are available at http://www.calmis.ca.gov/file/occup$/oeswages/oestechnotes.htm.

Based on these samples of representative jobs, each tourism type job pays only about 62% ($ 19,700 v $31,721) of the annual wages of a timber industry job. Therefore, approximately 1.6 new tourism industry jobs would be required to replace the loss of each timber industry job to maintain a balanced economic impact within the region.

While such a shift would balance regional economics in a gross sense, many of the affected individual timber workers would face a reduction in personal income.

Table III.7. Employment and Mean Annual Wage for Selected Occupations, North Coast, 2003.

Occupational Title	2003 Employment Estimates	Mean Annual Wage
First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers	120	$40,803
Forest and Conservation Workers	440	$21,495
Fallers	130	$51,267
Logging Equipment Operators	300	$36,497
Sawing Machine Setters, Operators, and Tenders, Wood	360	$30,463
Woodworking Machine Setters, Operators, and Tenders, Except Sawing	130	$30,861
Timber Industry - weighted	**1,480**	**$31,721**
First-Line Supervisors/Managers of Food Preparation and Serving Workers	510	$25,013
Cooks, Fast Food	310	$16,866
Cooks, Institution and Cafeteria	270	$25,722
Cooks, Restaurant	950	$18,299
Cooks, Short Order	750	$17,394
Food Preparation Workers	620	$18,322
Bartenders	430	$18,021
Combined Food Preparation and Serving Workers, Including Fast Food	1,850	$16,188
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	920	$16,692
Waiters and Waitresses	1,470	$15,595
Food Servers, Nonrestaurant	60	$18,294
Dining Room and Cafeteria Attendants and Bartender Helpers	390	$15,788
Dishwashers	550	$16,165
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	230	$15,618
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	1,340	$21,950
Maids and Housekeeping Cleaners	1,560	$16,894
Recreation Workers	320	$21,919
First-Line Supervisors/Managers of Retail Sales Workers	1,170	$33,782
Cashiers	5,100	$18,543
Gaming Change Persons and Booth Cashiers	160	$20,278
Counter and Rental Clerks	420	$20,255
Parts Salespersons	160	$27,954
Retail Salespersons	2,810	$22,064
Tourism Industry - weighted	**21,430**	**$19,700**

Source: http://www.calmis.ca.gov/file/occup$/oeswages/NorCoastoes.xls

5.8 2000- 2004 Job Growth Sectors

Figure III.10 shows the changes in employment levels associated with six major sectors from 1990 through 2004 in the North Coast. Figure III.10 indicates that the tourism and local government sectors have been the employment growth sectors during this period, with local government job having the greatest increase. Employment in wood products manufacturing, other manufacturing, and natural resources sectors have declined. Employment in construction has held roughly constant.

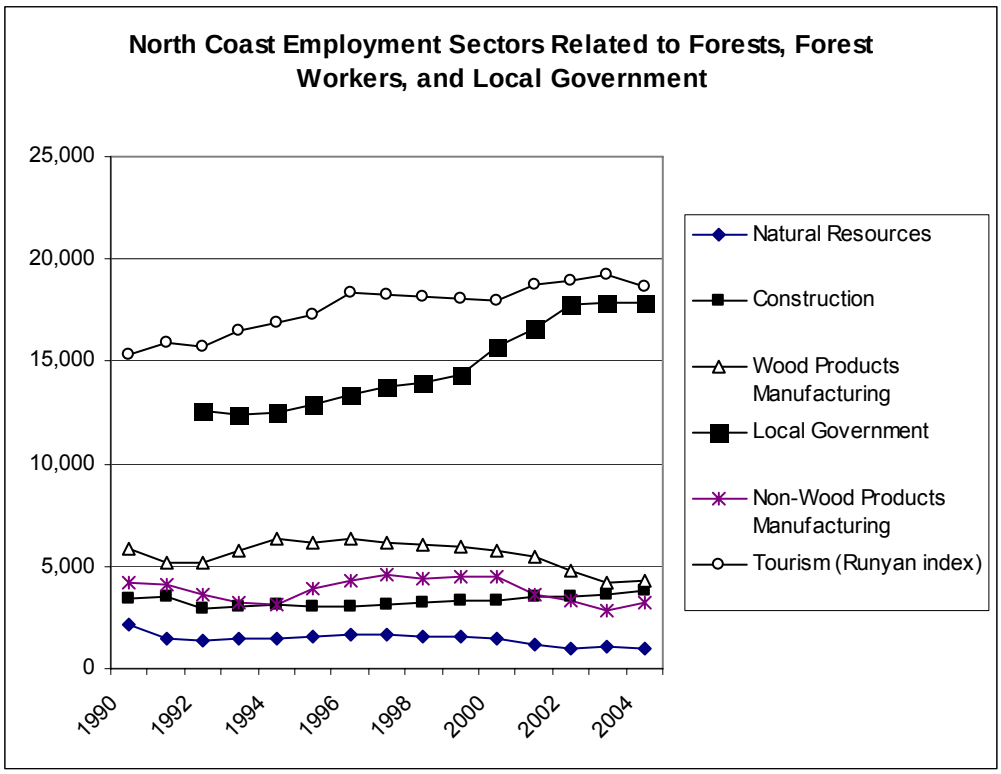

Figure III.10. North Coast Employment Trends by Sector, 1990-2004.

Figure III.11 presents the unemployment levels in three North Coast counties for the 1990-2004 period. In general, unemployment levels peaked in 1992, declined until about 2000, rose some 2001-2002, and then declined slightly in 2004.

Table III.8 focuses on the period of 2000 to 2004 for three North Coast counties. It shows that while the total number of regional jobs increased and unemployment levels stayed relatively flat (compared to an increase in statewide unemployment rates during the same period), the employment gains in the two sectors that grew (tourism and local government) raise other issues.

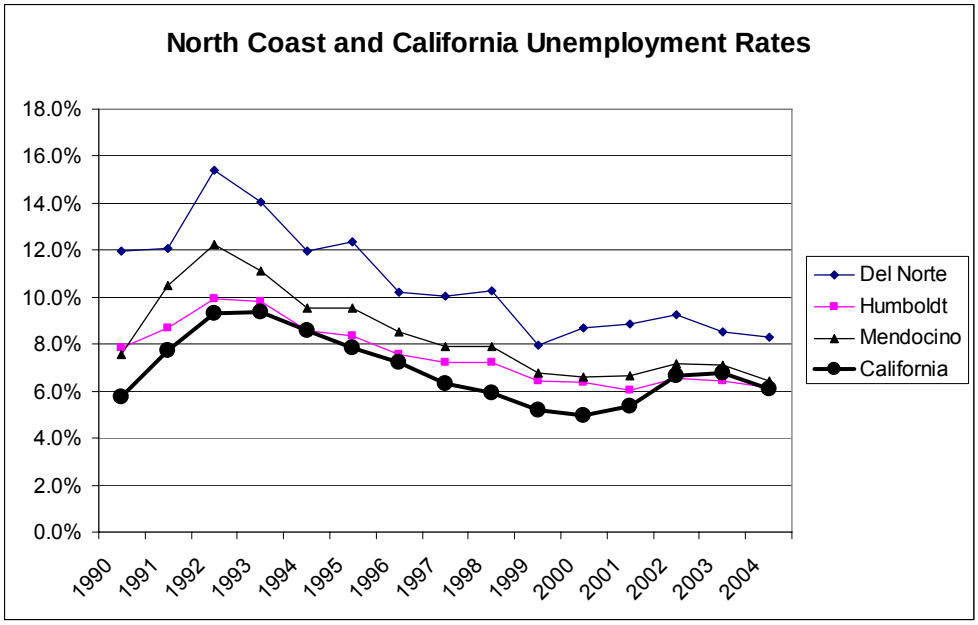

Figure III.11. North Coast Unemployment Trends, by County.

Table III.8. Employment Change by Sector, 2000-2004, North Coast.	
Employment Sectors for North Coast Region (3 counties)	2000 to 2004 change in jobs
Private and Public Jobs	2,883
Private Sector Jobs	-293
Net Manufacturing	-2,799
Net Timber (subset of Manufacturing)	-1,489
Net Tourism	665
Net Local Government	2,228

Based on an index of sectors closely tied to the tourism and recreation industries, it appears that the there was marginal gain in employment. These gains cannot offset the loss of timber sector jobs for two reasons. The first is that these jobs are primarily located away from the forest and could involve long commutes, especially for the more dispersed timber sector workers who work in the woods. The second reason is that jobs in the tourism industry generally pay far lower wages than those in the timber sector. The gain of 665 tourism sector jobs is equivalent to about 400 timber sector jobs in terms of income.

From 2000 to 2004, the net loss of jobs in the private sector was more than outweighed by a large increase in jobs in local government. While the growth in local government jobs buoyed the overall employment pattern and probably increased the level of governmental services provided to residents, it may be hard to sustain with the ongoing budget challenges at both the local and statewide level.

5.9 Regional Economic Patterns Related to Forests and other Wildlands – Five Redwood Counties v. the State

Table III.9 and Figures III.12 and III.13 provide comparative data for redwood counties and California as a whole for sectors that have direct relationships to forests and forestry. Within these counties that have redwood forests as well as a mix of natural resource, manufacturing, and tourism jobs there are noticeable patterns in terms of what drives higher countywide incomes. Logging and forest planning jobs are captured in the larger 'Agriculture, Forestry, and Fisheries' group but most jobs associated with the timber industry are in sawmills that are included under 'Manufacturing'.

Table III.9. Sectoral Employment and Median Household Incomes for California and Selected counties in 2000.

	Job Type				
	Agriculture, Forestry, Fisheries	Construction	Manufacturing	Recreation & Accommodations	Median Household Income (2000)
California	1.9%	6.2%	13.1%	8.2%	$ 47,493
Del Norte	6.2%	5.4%	4.4%	13.0%	$ 29,642
Humboldt	4.9%	5.8%	8.7%	9.8%	$ 31,226
Mendocino	7.1%	7.9%	10.1%	12.0%	$ 35,996
Sonoma	2.6%	8.5%	12.7%	7.9%	$ 53,076
Santa Cruz	4.4%	7.9%	12.4%	8.6%	$ 53,998
San Mateo	0.4%	6.2%	10.3%	7.4%	$ 70,819

Source:US Census 2003

A number of key points are relevant. First, median household incomes of the non-metropolitan redwood counties (Mendocino, Humboldt, Del Norte) are substantially below the state average. A considerable fraction of workers in the metropolitan redwood counties commute to world-renowned centers of industry (e.g., Silicon Valley) and commerce (e.g., San Francisco). Across both the metropolitan redwood counties (Santa Cruz, San Mateo, Sonoma) and the non-metropolitan redwood counties there are some other consistent patterns. As Figures III.12 and III.13 illustrate, there is a strong positive correlation between the fraction of the workforce in manufacturing and median household incomes and a strong negative correlation between the fraction of the workforce in 'recreation and accommodations' and median household incomes. Del Norte County is illustrative of the economic difficulties of a forested county that gone through the transition from an old growth timber economy to a recreation economy in the absence of a significant young growth timber economy. Although it has some of the most impressive redwood parks in the world, its labor force has actually declined since 1997, and it still has the highest unemployment rate in the region.

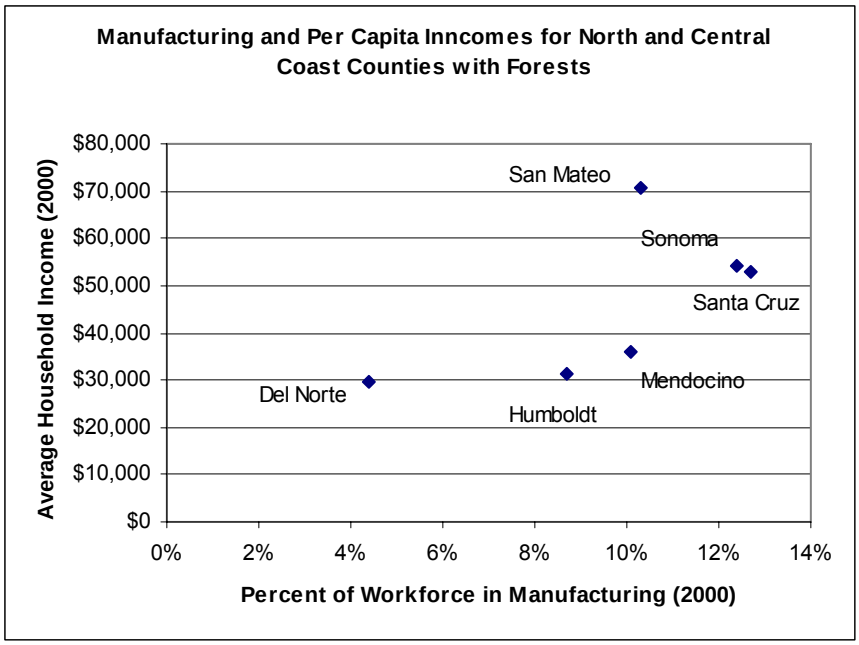

Figure III.12. Manufacturing Workforce Percent and Per Capita Income for North and Central Coast Counties with Redwood Forests.

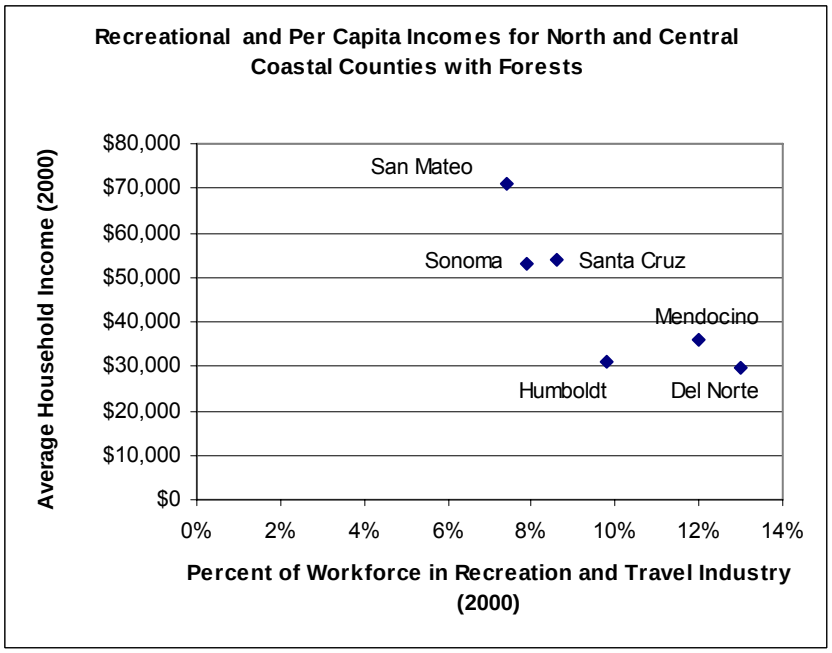

Figure III.13. Recreation and Travel Industry Workforce Percent and Per Capita Income for North and Central Coast Counties with Redwood Forests.

The comparison between the five redwood counties and California as a whole illustrates that the relatively high wage manufacturing jobs both increase the average wages in the county and are often associated with business purchases of high value goods and services from other local businesses. On the other hand, many of the jobs in the recreation and accommodation sectors are relatively low wage and the businesses themselves do not make significant expenditures on locally produced goods and services.

5.10 Sustainable Forestry, Recreational Opportunities, and Residential Neighborhood Compatibility

A review of economic, social, and community effects relevant to Jackson Demonstration State Forest, as well as its target audience for demonstration and extension (the private forest lands and the public benefits which come from those private lands) suggests the emergence of three major themes concerning the economic and social impacts of potential land use changes in the redwood region.

First, it appears that the transition to a young growth redwood industry is essentially complete. Old growth harvests have declined to minimal levels, especially when compared to the early1980s. Most of the major land owners now have forest management plans that include institutional arrangements to address fish and wildlife habitats, biodiversity, and needed watershed restoration investments. Habitat conservation plans, third party certification, and conservation easements are some of the institutional arrangements that can bring stability to long-term forestland ownership and management. Third party certification of forest management is now used by all of the major timberland owners, and considerable effort is going into development of cost-effective options for smaller landowners. However, the continued decline in the redwood premium, combined with increases in operating costs required by California's overlapping regulatory systems and delays from permitting agencies or the courts could reduce landowner's interest and financial ability to maintain large areas of expensive real estate in forest-products-based operations.

For some smaller nonindustrial forest landowners as well as for forests managed by various governmental agencies, there are a number of opportunities to increase recreational use that are compatible with sustainable timber management, and possibly net revenue, by increasing opportunities for activities that are not allowed in the more heavily visited state. The construction of high quality mountain biking trails offers a potential opportunity for new job and revenue generation in forest settings.. Mountain biking on logging roads, and in some cases specially designed trails, is often not allowed in parks but is a growing use that also has significant regional economic benefits akin to the snowshoeing and skiing on public and private forests in the Sierra Nevada. In a mixed forest area in Marin County, the Boy Scouts of Marin County worked with local biking organizations to build a specialized trail system for which they now collect fees for trail use (http://www.boyscouts-marin.org/camps/fot.htm).

Second, at the regional level, a continued decline in the timber-based economy will not be offset by growth in economic activity associated with redwood parks or in other sectors of the tourism industry. Most of the tourism and recreation economic activity of the North Coast region is tied to overnight visitors who are concentrate their activities along the coastline or on the Highway 101 corridor. Day use visitors to forests, both public and private, are a significant part of the quality of life of local residents and visitors but generate few new jobs or fees in the region. Beyond these new recreational activities, demand for recreational access to redwood areas does not appear to be increasing. Unlike visits to beach parks, visits to redwood parks declined in the 1990s in the non-metropolitan counties. Statewide, there are many indications that the benefits of day use and associated open space values will continue to increase where the forest is in close proximity to large population centers. More affluent metropolitan counties have been active in fee-title or conservation easement purchases of high value lands.

Third, there has been a significant increase in the extent of the rural residential overlay within redwood forests. Most of the redwood forests in four areas—most of Santa Cruz county, the Russian River region in Sonoma, the Fort Bragg to Mendocino region of central Mendocino coast and the southeast side of Humboldt Bay in Humboldt county—now effectively have an understory of houses and associated residential land uses. The environmental impacts in terms of altered wildlife habitats, new sources of water pollutants, and the potential for more exotic invasive plant and animal species will continue to grow. In addition, the challenge of ensuring public safety to a more dispersed population will create new costs to local governments.

The legislative intent for the creation of state forests and a number of state forest laws center around the social value of maintaining private forest lands as unfragmented ownerships even if land conversion may be financially advantageous to the owners through leapfrog or premature conversion to residential uses. The evidence from the North Coast region suggests that demonstrating the numerous environmental, economic and social benefits of maintaining working private forests remains a valuable role.

6. JDSF: Social and Economic Setting—Mendocino County Specific

6.1 Social Setting

Mendocino County is located north of Sonoma County, which is rapidly becoming integrated into the San Francisco Bay Area economy, and south of the forest dominated counties of Humboldt and Del Norte. The social and demographic characteristics of Mendocino mirror its geographic position. As shown in Table III.10, poverty levels, work force participation, and median household income levels are generally not as favorable as those in Sonoma but better than those in the counties to the north. In 2000, the median household income in Mendocino was 76 percent of the statewide average. This difference is not driven by a greater proportion of its population not working (poverty rates and workforce participation rates are similar to statewide rates) but a lack of high wage jobs. Demographically, Mendocino has a higher percentage of people of Hispanic origin and a higher median age than the forested counties to the North. From a housing

perspective, Mendocino has a slightly higher occupant per room density than neighboring counties and nearly twice as much of its housing stock in vacation or second homes (5% v. 2-3%). Houses and communities are constantly changing. Like other counties, in 1999, nearly 20% of the Mendocino County residents had lived in another county in 1995. Another strong link between households and the forests is that nearly a quarter of all homes in Mendocino County heat primarily with wood.

Table III.10. Social and Demographic Characteristics of Mendocino and other areas.

Demographic Characteristic	Sonoma	Mendocino	Humboldt	Del Norte	California
Total Population (2000)	458,614	86,265	126,518	27,507	33,871,648
Median Household Income (2000)	$ 53,076	$ 35,996	$ 31,226	$ 29,642	$ 47,493
Pct of State HH Income	112%	76%	66%	62%	100%
Ethnicity and Race					
White alone	75%	75%	82%	70%	47%
Hispanic (of any race)	17%	17%	7%	14%	32%
Other	8%	8%	11%	16%	21%
Median Age	38	39	36	36	33
Poverty Status in 1989					
Families	5%	11%	13%	16%	11%
Families with female householder, no husband present	14%	29%	35%	43%	25%
Individuals	8%	16%	20%	20%	14%
Work force participation					
All, over 16	67%	62%	60%	47%	62%
Male, over 16	74%	68%	65%	44%	70%
Female, over 16	60%	57%	56%	50%	56%
Education					
High School or greater	85%	80%	85%	72%	77%
Bachelor's degree or greater	29%	20%	23%	11%	27%
Housing					
Occupied	94%	90%	92%	88%	94%
Vacant, non-recreational	3%	5%	5%	9%	4%
Vacant, recreational	2.4%	5.4%	3.1%	3.2%	1.9%
Owner-occupied	64%	61%	58%	64%	57%
Greater than 1.0 occupants per room	7%	8%	5%	6%	15%
Heating					
Gas	77%	53%	70%	9%	74%
Electricity	18%	14%	10%	48%	22%
Wood	5%	26%	18%	24%	2%
Moved to county since 1995	19%	18%	19%	13%	19%

JDSF is located in Mendocino County near the towns of Fort Bragg, Willits and Mendocino. Its western edge is near the Pacific Coast Highway and its eastern edge is near the town of Willits along State Highway 101. This area between the coast and the interior valleys is dominated by forests with residential development concentrated along the coast and the Highway 101 corridor.

In 2004, Mendocino County had a population of 89,190, of whom 60,865 lived in unincorporated areas. The county has a land area of 2.2 million acres.

Population in the area around JDSF has grown substantially since 1990. As shown in Table III.11, the populations of Mendocino County, Fort Bragg and Willits have all increased. The population in the unincorporated areas of the county is growing faster than the incorporated areas. The higher vacancy rate in unincorporated areas reflects both the number of second homes in Mendocino (about 5% of the total housing stock) as well as the interest of many new homeowners to build homes on much larger lots.

Table III.11. Mendocino County Population Characteristics 1990, 2000, and 2004

Locale	1990	2000	2004	Percent of Total Population in 2004	Percent Housing Vacancy Rate in 2004	Percent of Housing as Single Family detached in 2004
Mendocino County	80,345	86,265	89,190	100%	10%	70%
Fort Bragg	6,078	6,814	6,898	8%	7%	65%
Willits	5,027	5,073	5,034	6%	4%	59%
Unincorporated Areas	54,201	58,407	60,865	68%	13%	75%
Incorporated Areas	26,144	27,858	28,325	32%	4%	59%
Source: Department of Finance						

6.2 Economic Setting

The recently completed “Background Report for the County of Mendocino General Plan Update” (Pacific Municipal Consultants, January 2003) provides a thorough background on much of the economic setting relevant for JDSF in terms of the central Mendocino Coast as well as the broader target of private forests in the county.

6.2.1 Major Economic Sectors in Mendocino County

The Economic Development section of the Background Report provides a succinct summary of the economic challenges facing Mendocino County. It notes that:

> Of primary interest is the creation of well-paying jobs to support incomes for residents in the County. This not only supports the economic well-being of the County's residents, but also leads to additional sales and income for local retail businesses. The sales taxes paid by these businesses, as well as visitor serving businesses, are a major source of revenue for County government. These revenues help pay for services to residents of the County. With the passage of Proposition 13, local government can no longer rely primarily on property taxes to fund necessary services. A well-balanced business mix is essential to providing both private income and public revenue. (page 3-1)

With respect to the timber and wood products industry, the second largest industrial sector after Agriculture and Food Processing, the report noted that:

> Of the three dozen former mills in the County, only a handful remains open (Hopland, Ukiah, The Forks, Calpella, Redwood Valley, Willits, Branscomb, and Philo in 2003), some just barely. Many factors, including pressure from environmental groups and regulatory agencies, will combine to determine the sustainable harvest level. . . Employees laid off from closed mills may often try to stay in the community, taking low-paying jobs, but many also must move away to find jobs. (pages 3-2, 3-3).

The pattern of social dislocation of unemployed timber workers who must move or take a lower paying job is very similar to what was observed in Oregon over a similar period and described in section 5.4.4.

6.2.2 Supporting and Growing Competitive Industries

In describing the prospects for Mendocino County's ability to support and grow specialized and competitive industries, the Economic Development chapter of the Background Report provided useful insights into the nature and location of both the timber and tourism industries. It identified local concentration and relative employment growth as key metrics for identifying sectors that are projected to have the potential to be a large and growing part of the local economic base. Based on their analysis of 3-digit SIC (Standard Industrial Classification) codes for 1991 and 1999 they identified both the "lumber and wood products industry cluster" and the "tourism industry cluster" as vital pillars of the current and future Mendocino economy. Comparative economic advantages of these clusters are related to features such as specialized marketing organizations, credit and transport facilities, a trained labor force, and the existence of complementary industries.

Using a broader definition of workers than just those in the sawmill sector, the report calculated that the lumber and wood products industry cluster accounts for 2,520 or 9.2 percent of all the wage and salary jobs in the County in 1999. This reflects a loss of 354 jobs since 1991. During this period, the only segment of the cluster to show any

employment growth was logging, which gained 149 jobs. In 1999, the lumber and wood products industry cluster average annual wage was $33,245—higher than the County's average at $21,507. Logging and wood products manufacturing have provided an excellent opportunity for high paying, blue collar jobs for decades. These have been valued by county residents, as they typically do not require extensive education or formal training. The downturn of timber production has spread to a broad range of wood products occupations including forestry, timber falling, choker setting, mechanic, truck driving, millwright, sawyer, planer operator, board handler, log and lumber grader, and electrician. Many of these workers have had to take cuts in hours worked, cuts in pay, or are forced to relocate, retire, or retrain in new occupations.

6.2.3 Mendocino's Tourism Industry

The Background Report provides a thorough overview of the tourism industry. It estimated that Mendocino County had a $303 million tourism industry in 1999, making it the third largest industry after agriculture and wood products. The analysis pointed out that the industry is dominated by coastal visitation as well as by activity in the inland communities along the State Route 101 corridor. A substantial amount of State Route 101 traffic utilizes commercial services in Hopland, Ukiah, and Willits. These communities have not historically been visitor destinations, and are challenged to attract the pass-through highway traffic. The expansion of Indian casinos along the corridor is adding to the activity.

The Report defines the tourism industry to include eating and drinking places, hotels and other lodging, and a variety of recreation, cultural, and amusement attractions. They estimate that the tourism industry cluster accounted for 6,660 jobs, although many of these jobs are seasonal or less than full time. The top growth occurred in lodging and recreation places, which added 765 jobs between 1991 and 1999. Eating and drinking places, supported in part by local residents as well as visitors, accounted for 2,387 jobs in 1999, followed by hotels and other lodging places with 1,238 jobs. The report noted that in 1999, the tourism cluster average annual wage was $14,780, lower than the County's average at $21,507.

For 1999 the study identified four major components of the tourism industry.

- More than half (58 percent) of the $303 million visitor spending came from overnight guests at bed and breakfast inns, motels, and vacation rentals. The coastal area attracts the majority of overnight guests with most of the remainder utilizing lodging establishments along the State Route 101 corridor.
- Day travelers comprise 21 percent of visitor spending. This includes all Mendocino County spending by visitors traveling the State Route 101 corridor, as well as any day visitors traveling along the coastal highways.
- Eleven percent of Mendocino County's visitor spending comes from campers. This visitor segment is oriented to more outdoor recreation,

spends less on lodging, and many prepare their own food. They spend more in local grocery stores, and less eating out.

- Ten percent of visitor spending in Mendocino County is from persons visiting friends and family who are permanent residents.
- (Source: Pacific Municipal Consultants 2003)

6.2.4 Employment Trends in major sectors from 1990 to 2004

As shown in Figure III.14 and Table III.12, Mendocino County has had similar changes between 2000 and 2004 as the larger North Coast region. The County lost many jobs in timber and other manufacturing sectors, made some gains in the tourism industry that only partly compensated for lost income, and registered a substantial increase in local government employment. As pointed out in the previous chapter, the dominance of local government as the primary source of new jobs would not appear to be a sustainable strategy for economic growth or county revenues.

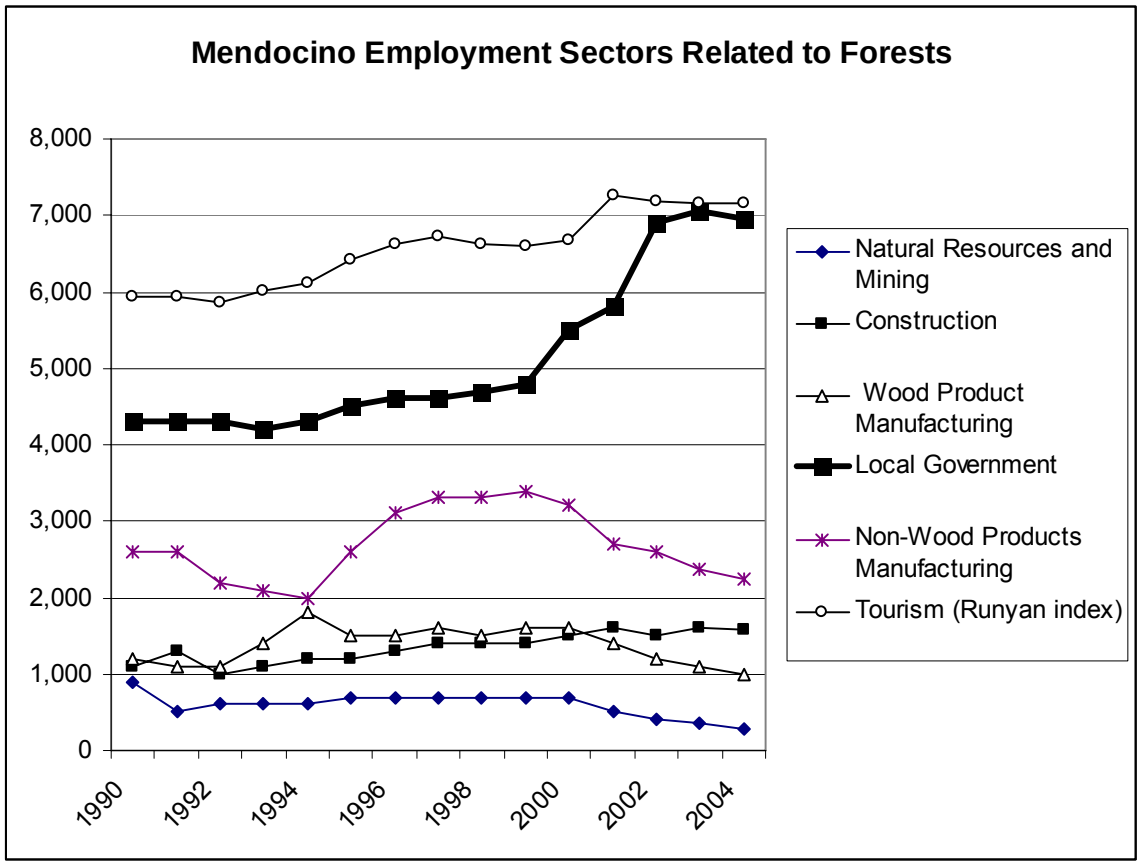

Figure III.14. Mendocino County Employment by Sector, 1990-2004.

Table III.12. Employment Change by Sector, 2000-2004, Mendocino County.	
Employment Sectors	2000 to 2004 Change in Jobs
Private and Public Jobs	300
Private Sector Jobs	-1,129
Net Manufacturing	-1,543
Net Timber (subset of Manufacturing)	-595
Net Tourism	487
Net Local Government	1,453

6.2.5 Jobs and Revenue at Different Harvest Levels

For predicting employment changes related to changing levels of harvest output from Jackson Demonstration State Forest, or other timberlands in Mendocino County, a conservative ratio of 8 direct workers per million board feet of harvest was used rather than the much higher jobs/MMBF ratios experienced in Mendocino since 2000. The total of 8 direct jobs per million board feet of harvest is based on 7 workers per MMBF in sawmills and related wood remanufacturing plants and 1 worker per MMBF working in the logging, log transport, and reforestation sectors.

Table III.13 presents a range of employment, regional income, and local tax estimates that would correspond to various levels of annual timber harvest. In addition to the benefits to local workers and local government revenue, increased economic output from the state forest supports other local business revenues. It also provides the funds necessary to continue to upgrade the road system to reduce sediment and peak water flow runoff, maintain research programs, fund the extension and outreach program, and improve recreational facilities. In simple terms, every change of 10 million board feet of annual harvest is related to 160 jobs, $4.3 million in local wages, and $184,000 in local taxes. Section VII.6.3, Timber Resource, will discuss the potential economic effects of the harvest levels associated with the seven EIR alternatives.

Current recreational opportunities on Jackson Demonstration State Forest do not appear to be directly tied in a positive or negative manner to harvest levels since the harvest units are scattered across the forest and are only closed for a limited period of time. In the short term, recreational use will move when seasonally limited to permit the safe use of harvesting and reforestation equipment. The ability of JDSF to maintain recreational infrastructure such as roads, trails, and trash removal is reduced when reductions in timber revenue force decreases in personnel working on the Forest. In the longer term, a combination of JDSF staff time, internally generated funds, potential state grants, and partnerships with local recreation use organizations will drive the design and development of new recreational opportunities on the forest.

Table III.13. Employment and Revenue Effects of Various Timber Harvest Levels.

Variable	Timber Harvest MMBF (million board feet)	5	10	20	30	40	50
$500/MBF	Stumpage value	$2,500,000	$5,000,000	$10,000,000	$15,000,000	$20,000,000	$25,000,000
2.60%	Local yield tax to Mendocino	$65,000	$130,000	$260,000	$390,000	$520,000	$650,000
Fixed by acreage	Property tax	$112,438	$112,438	$112,438	$112,438	$112,438	$112,438
Full-time equivalent positions	JDSF timber staff	5	10	15	20	20	25
8 jobs per MMBF	Direct Timber Employment (based on Mendo. and Humboldt ratios)	40	80	160	240	320	400
8 jobs per MMBF	Indirect Timber Employment (1:1 ratio)	40	80	160	240	320	400
$31,721 (same as direct estimate)	Estimated Wages JDSF	$158,605	$317,210	$475,815	$634,420	$634,420	$793,025
$31,721 (2003 salary survey)	Direct Wages non JDSF	$1,268,840	$2,537,680	$5,075,360	$7,613,040	$10,150,720	$12,688,400
$19,700 (2003 salary survey for service workers)	Indirect Wages	$788,000	$1,576,000	$3,152,000	$4,728,000	$6,304,000	$7,880,000
	Total Wages	$2,215,445	$4,430,890	$8,703,175	$12,975,460	$17,089,140	$21,361,425
1.25% of wages	County Sales Tax from wages (JDSF, Direct, Indirect)	$27,693	$55,386	$108,790	$162,193	$213,614	$267,018
	All Local Taxes (timber, property, sales on wages)	$205,131	$297,824	$481,228	$664,631	$846,052	$1,029,456
	Local Employment	85	170	335	500	660	825

6.3 Other Considerations

JDSF is a demonstration forest, used to demonstrate techniques that are of possible use to other Northern California landowners. The Forest is managed to favor relatively rare vegetation and to favor wildlife to a degree greater than required of private forests. The protection of flora and fauna has economic values, though those values are difficult to quantify and are partially represented in the value for recreation. The Forest also produced mushrooms, forest greens, and firewood. In many respects, the Forest plays a valuable role for surrounding private forest landowners by allowing for the empirical testing on public land of how alternative land use patterns will affect non-timber values. Without such a public resource to test alternatives, regulatory guidelines are often proposed with limited understanding of their overall effectiveness and cost.