

Appendix

I Legislation, Policy and Regulations

This appendix pulls together in one place for convenient reference the legislation, regulations and Board of Forestry and Fire Protection policies that pertain to State Forests.

Public Resources Code

708. For the purpose of disseminating information relating to its activities, powers, duties, or functions, the department, with the approval of the Department of General Services, may issue publications, construct and maintain exhibits, and perform such acts and carry on such functions as in the opinion of the director will best tend to disseminate such information. Such publications may be distributed free of charge to public libraries and to other state departments and state officers. The department may exchange copies with contemporary publications. All money received by the department from the sale of publications shall be paid into the State Treasury to the credit of the General Fund.

740. The board shall represent the state's interest in the acquisition and management of state forests as provided by law and in federal land matters pertaining to forestry, and the protection of the state's interests in forest resources on private lands, and shall determine, establish, and maintain an adequate forest policy. General policies for guidance of the department shall be determined by the board.

4332. Whenever it is necessary in the interests of public peace or safety, the director, with the consent of the Governor, may order closed to camping, hunting, trapping, or the use of firearms, any area in any state park or state forest. The director shall post and enforce such closure order in such area.

4333. Any order which is issued pursuant to Section 4332 shall be published twice in at least one newspaper of general circulation in any county that is affected by the order. The publication shall be separated by a period of not less than one week and not more than two weeks. The order shall also be posted in such public places in each county as the director may direct, and along roads and trails which pass through such areas declared to be closed to camping or entry.

4631. 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. It is further declared to be the policy of the state to acquire by purchase, exchange, lease, or grant all of the following:

(a) Such cutover lands, the reforestation of which is not assured under private ownership, to reforest such lands during periods of unemployment and at other times.

(b) Liquidating forest lands primarily suitable for timber production which may be acquired under precutting agreements.

(c) Demonstration forests of 2,000 acres or less adapted to furnish local needs of investigation, demonstration, and education in those timber counties where the ownership pattern is such that management of small areas is an important problem.

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(d) One area, not to exceed approximately 40,000 acres, in each of the following forest districts, Coast Range Pine and Fir District, North Sierra Pine District and the South Sierra Pine District, for the purpose of demonstration of economical forest management. These areas shall not include virgin timber except that which is incidental to areas previously harvested.

4631.5. It is further declared to be in the interest of the welfare of the people of this state that the state do all of the following:

(a) Retain the existing land base of state forests in timber production for research and demonstration purposes.

(b) Cooperate with local governments in mitigating the impacts on school enrollment of geothermal development which occurs in proximity to state-owned forest lands.

4635. Unless the context otherwise requires, the definitions in this article govern the construction of this chapter.

4636. "Continuous production" means such management as will approach a balance between depletion and growth.

4637. "Forest land" means lands primarily suited to growing timber and other forest products.

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

4639. "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.

4640. "Protection" means protection of forest trees against damage by fire, insects, disease, and trespass.

4641. "Purchase area" means an area of forest land within which forest lands of sufficient acreage may be available and can be consolidated to make state forest units.

4642. "Reforestation" includes reforestation by natural means from seed and artificially by seeding or planting.

4643. "State forest" means forest land owned or to be owned by the state.

4645. The department, in accordance with plans approved by the board, may engage in the management, protection, and reforestation of state forests.

4646. The director, acting in accordance with policies adopted by the board, shall administer this chapter. He may exercise all powers necessary to accomplish its purposes and intent.

4647. The department shall prepare a map setting forth the boundaries of purchase areas, and it shall prepare data relating to the forest conditions within these areas. In the preparation of the map and data the department shall be guided by, but not limited to, a report prepared and submitted to the Legislature by the California Forestry Study Committee provided for in Chapter 1086, Statutes of 1943. The department shall make the necessary surveys, examinations, appraisals, inventories, and title searches and obtain other pertinent data and information bearing on tracts of forest land offered for sale for state forest purposes.

4648. Acquisition of forest land pursuant to this chapter shall be made only upon the approval of the director. Approval by the director shall be based on satisfactory evidence presented to him by the board as to the suitability and desirability of lands under consideration for purchase for state forest purposes.

This suitability and desirability shall be predicated on, but not limited to, the following factors:

- (a) That the lands are suited primarily to timber growing.
- (b) That the lands represent growing capacities not below the average for the timber region.
- (c) That they are favorably situated for multiple use and economical administration, management, and utilization.

The director shall not approve the acquisition of any lands pursuant to this chapter unless he receives a resolution recommending such action adopted by the board of supervisors of the county in which such lands are situated following a public hearing held by the board of supervisors on the proposed acquisition. Notice of the hearing shall be published pursuant to Section 6066 of the Government Code. The holding of a hearing shall be optional to the board of supervisors for areas of 2,000 acres or less. Upon approval of a purchase by the director, the department may negotiate for and consummate the purchase of the lands.

4649. Whenever it is deemed advisable and advantageous, the board may enter into an agreement with the Department of Corrections, or the Youth Authority for employment of inmates of these institutions in work on state forests.

4650. (a) With the approval of the Director of General Services, the director may make sales of forest products from state forests that do not exceed ten thousand dollars (\$10,000) in value without advertising for bids. With the approval of the Director of General Services, the director may also make sales that do not exceed 100,000 board feet of dead, dying, downed, diseased, or defective trees, trees harvested in connection therewith for thinning purposes or other forest improvement work, or any combination thereof, without advertising for bids.

(b) Any sale of forest products in excess of ten thousand dollars (\$10,000) in value, or in excess of 100,000 board feet with respect to dead, dying, downed, diseased, or defective trees, trees harvested in connection therewith for thinning purposes or other forest improvement work, or any combination thereof, shall be upon competitive bids. Advertising for bids shall be the same as is generally in use for the sale of state property.

4650.1. (a) Notwithstanding any other provision of law, timber from state forests shall not be sold to any California division of a primary manufacturer, or to any person for resale to a primary manufacturer, who does either of the following:

(1) Uses that timber at any plant not located within the United States unless it is sawn on four sides to dimensions not greater than 4 inches by 12 inches.

(2) Within one year prior to the bid date and one year after the termination of the contract, sells unprocessed timber, which is harvested from private timberlands and is exported into foreign commerce from this state.

(b) Any purchaser of timber from state forests who makes use of timber in violation of paragraph (1) of subdivision (a) is prohibited from purchasing state forest timber for a period of five years and may have his or her license suspended for a period of up to one year.

(c) The department may adopt appropriate regulations to prevent the substitution of timber from state forests for timber exported from private timberlands.

(d) For purposes of this section, "unprocessed timber" means trees or portions of trees or other roundwood not processed to standards and specifications suitable for end product use, but does not include timber processed into any of the following:

(1) Lumber or construction timbers, except Western Red Cedar, meeting current American Lumber Standards Grades or Pacific Lumber Inspection Bureau Export R or N list grades, sawn on four sides, not intended for remanufacture.

(2) Lumber, construction timbers, or cants for remanufacture, except Western Red Cedar, meeting current American Lumber Standards Grades or Pacific Lumber Inspection Bureau Export R or N list clear grades, sawn on four sides, not to exceed 12 inches in thickness.

(3) Lumber, construction timbers, or cants for remanufacture, except Western Red Cedar, that do not meet the grades referred to in paragraph (2) and are sawn on four sides, with wane less than 1/4 of any face, not exceeding 83/4 inches in thickness.

(4) Chips, pulp, or pulp products.

(5) Veneer or plywood.

(6) Poles, posts, or piling cut or treated with preservatives for use as such.

(7) Shakes or shingles.

(8) Aspen or other pulpwood bolts, not exceeding 100 inches in length, exported for processing into pulp.

(9) Pulp logs or cull logs processed at domestic pulp mills, domestic chip plants, or other domestic operations for the purpose of conversion of the logs into chips.

4651. The management of state forests and the cutting and sale of timber and other forest products from state forests shall conform to regulations prepared by the director and approved by the board. These regulations shall be in conformity with forest management practices designed 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. The sale of timber and other forest products is limited to raw materials only.

4652. Receipts from the sales of forest products shall be deposited monthly with the State Treasurer in the Forest Resources Improvement Fund. The Controller shall keep a record of accounts of such receipts separately.

4653. State-owned lands classified by the department and approved by the board as not suited to the growing of forest products, or necessary to the management of the forest, shall be sold according to state laws.

4654. There shall be paid to each county in which lands acquired for state forest purposes are situated, out of funds hereafter made available for such purpose, an amount equivalent to taxes levied by the county on similar land similarly situated in the county in the same manner as provided in the Revenue and Taxation Code for secured property tax payments as long as the state continues to own the land.

Such payments shall be based only upon the value of the forest lands used for purposes of continuous commercial forest production and not upon value of such forest land used for any other purposes, including any improvements on such lands. Determination of what constitutes similar land similarly situated shall be made by a committee consisting of the county assessor of the county in which the land is located, a representative of the State Board of Equalization and a representative of the department.

The money received by any county pursuant to this section may be expended by it for any proper state purpose not prohibited by the State Constitution.

4655. Tax-deeded lands classified as forest lands, pursuant to Chapter 4.3 (commencing with Section 3534), Part 6, Division 1 of the Revenue and Taxation Code, may be acquired for the state forest purposes through the usual procedure governing the sale of tax-deeded lands.

4656. This chapter does not interfere with the reasonable use of state forests for hunting, fishing, recreation and camping, except as otherwise provided by law.

The use of state forest lands for grazing and mining purposes shall be permitted pursuant to regulations established by the board in accordance with Chapter 3. 5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code. The use and development of water facilities for irrigation and power shall be permitted as provided by law.

4656.1. The board may establish rules and regulations, in accordance with Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code, for the preservation, protection, and use of state forests and for the promotion and protection of public health and safety within state forests.

4656.2. The department shall protect the state forests from damage and preserve the peace therein.

4656.3. Any person who violates the rules and regulations pertaining to the state forests established by the board is guilty of a misdemeanor and upon conviction shall be punished by a fine not exceeding one thousand dollars (\$1,000).

4657. Insofar as the provisions of this chapter may be in conflict with any other provision of this division, the provision of this chapter shall control.

4658. The Mountain Home Tract Forest in Tulare County shall be developed and maintained, pursuant to this chapter, as a multiple-use forest, primarily for public hunting, fishing, and recreation. In future acquisitions and exchanges of land, as provided by law, the acreage in state ownership shall not be reduced below 4,000 acres.

4660. It is hereby declared to be the policy of the state to establish and preserve an intensively managed, multifaceted research forest which is representative of forest activities as a living forest in Santa Cruz County within northern California's coastal redwood belt. The coast redwoods, as the dominant tree species in this area, are a valuable natural resource and are unique in North America for their beauty, abundance, diversity, and public accessibility, and their extreme beauty and economic value requires special measures for their protection for the use, enjoyment, and education of the public.

It is the intent of the Legislature, in establishing the Soquel Demonstration State Forest, to provide an environment that will do all of the following:

(a) Provide watershed protection for local communities and base-line monitoring and studies of the hazards, risks, and benefits of forest operations and watersheds to urban areas.

(b) Provide public education and examples illustrating compatible rural land uses, including sustained yield timber production, as well as the historic development of timbering and forestry machinery, within the context of local community protection and nearby pressures.

(c) Provide a resource for the public, environmental groups, elected officials, environmental planners, the educational community, and the media as an open environment for the inspection and study of environmental education, forestry practices, and effects thereof.

(d) Protect old growth redwood trees.

4661. The department may permit a limited amount of commercial timber operations on the property within the Soquel Demonstration State Forest in order to provide funds for the maintenance and operation of the state forest and to allow fulfillment of the objectives of Section 4660. Income from the state forest property shall sustain all costs of operation and provide income for research and educational purposes.

4662. The department is responsible for the establishment and development of the Soquel Demonstration State Forest and for ongoing maintenance and operations. The director shall appoint an advisory committee to assist the department in planning future management of the forest. The advisory committee shall include representatives of the Santa Cruz County Board of Supervisors, the Department of Parks and Recreation, the State Board of Forestry and Fire Protection, the Forest of Nisene Marks Advisory Committee, and the Department of Fish and Game.

4663. The department, in coordination with the advisory committee, shall adopt by January 1, 1989, a general plan for the state forest which reflects the long-range development and management plans to provide for the optimum use and enjoyment of the living forest, as provided in Section 4660, as well as the protection of its quality and the watershed within the Santa Cruz area. The general plan shall be approved by the advisory committee prior to adoption by the department.

4664. The duties and authority of the department pursuant to this article shall only arise if the state acquires the property comprising the Soquel Demonstration State Forest.

4799.13. (a) There is hereby created in the State Treasury, the Forest Resources Improvement Fund. The money in the Forest Resources Improvement Fund may only be expended, upon appropriation by the Legislature, for the following purposes: (1) Forest improvement programs and related administrative costs pursuant to Chapter 1 (commencing with Section 4790). (2) Urban forestry programs and related administrative costs pursuant to Chapter 2 (commencing with Section 4799.06). (3) Wood energy programs pursuant to Chapter 4 (commencing with Section 4799.14). (4) Reimbursing the General Fund for the cost of operation of the state forests administered by the director pursuant to Section 4646. (5) Cost of operations associated with management of lands held in trust by the state and operated as demonstration state forests by the department pursuant to Section 4646, if those lands are managed so that they produce revenue that offsets, within a reasonable period of time, any costs to the state of managing those lands. (6) Forest pest research and management, technical transfer, and outreach. (7) State nurseries programs pursuant to Article 2 (commencing with Section 4681) of Chapter 10 of Part 2. (8) Costs associated with administration of the Z'Berg-Nejedly Forest Practice of 1973 (Chapter 8 (commencing with Section 4511) of Part 2). (b) The Forest Resources Improvement Fund shall be the depository for all revenue derived from the repayment of loans made or interest received pursuant to Chapter 1 (commencing with Section 4790), and the receipts from the sale of forest products, as defined in Section 4638, from the state forests. Ten percent of the net state forest receipts from the sale of forest products, after the General Fund is reimbursed for costs of operating the state forests, is available, upon appropriation by the Legislature, for urban forestry programs pursuant to Chapter 2 (commencing with Section 4799.06) of this part. (c) The director may accept grants and donations of equipment, seedlings, labor, materials, or funds from any source for the purpose of supporting or facilitating activities undertaken pursuant to this part. Any funds received shall be deposited by the director in the Forest Resources Improvement Fund. None of these funds received prior to the effective date of the act adding paragraphs (7) and (8) to subdivision (a) are available for the purposes of paragraph (7) or (8) of subdivision (a). (d) Each proposed expenditure by the department of money from the Forest Resources Improvement Fund shall be included as a separate item and scheduled individually in the Budget Bill for each fiscal year for consideration by the Legislature. These appropriations shall be subject to all of the limitations contained in the Budget Bill and to all other fiscal procedures prescribed by law with respect to the expenditure of state funds.

5820. This chapter shall be known and may be cited as the Mendocino Woodlands Outdoor Center Act.

5821. The Legislature finds that there is need for a program to enable the children of the state to better comprehend the outdoors, particularly the social and economic importance of the study, conservation, protection, and utilization of natural resources. The Legislature further finds that the location and facilities of the Mendocino Woodlands Outdoor Center are especially well suited to serve primarily as an outdoor

education center under the control and management of the Department of Parks and Recreation, as a unit of the state park system.

5822. The Legislature hereby declares its intent that the Mendocino Woodlands Outdoor Center, consisting of land and facilities deeded to the State of California by the United States of America for public park, recreational, and conservation purposes, shall hereafter be maintained, provided, and operated for the benefit of the people of the state, primarily as an outdoor environmental education facility.

5823. As used in this chapter, unless the context clearly requires a different meaning: (a) "Department" means the Department of Parks and Recreation. (b) "Center" means the Mendocino Woodlands Outdoor Center, consisting of 720 acres, more or less, of state-owned land and improvements located within the east half of the Northeast Quarter and the east half of the Southeast Quarter of Section 13 of the east half and southwest quarter of the Northeast Quarter and the east half and southwest quarter of the Southeast Quarter of Section 24 of T. 17 N., R. 17 W., M.D.B.M.; the north half and southwest quarter of the Northwest Quarter and the north half of the Northeast Quarter of Section 18 of, and the west half of the Northwest Quarter of Section 30 of, T. 17 N., R. 16 W., M.D.B.M. (c) "Area" means the Mendocino Woodlands Special Treatment Area within the Jackson State Forest, consisting of 2,550 acres, more or less, of state-owned lands lying within the south half of Section 12 of; the Northwest Quarter, the west half of the Northeast Quarter, the west half of the Southeast Quarter, and the Southwest Quarter of Section 13 of, the Northeast, Southeast, and Southwest Quarters of Section 14 of, the northeast quarter of the Northeast Quarter of Section 22 of, the north half of Section 23 of, the Northwest Quarter, the northwest quarter of the Northeast Quarter, and the northeast quarter of the Southwest Quarter of Section 24 of, T. 17 N., R. 17 W., M.D.B.M.; and the Southwest Quarter of Section 7 of the southeast quarter of the Northwest Quarter, the south half of the Northeast Quarter, the northwest, northeast, and southwest quarters of the Southeast Quarter and the Southwest Quarter of Section 18 of, and the Northwest Quarter and the west half of the Southwest Quarter of Section 19 of, T. 17 N., R. 16 W., M.D.B.M.

5824. Jurisdiction and control of the center, consisting of 720 acres, more or less, and all the improvements thereon as described in subdivision (b) of Section 5823 is hereby transferred to the department from the Department of Conservation, and shall be administered as a unit of the state park system; except that access shall be provided through the center to the area, as described in subdivision (c) of Section 5823, for purposes of cutting timber under the authority of the State Forester exercised pursuant to Article 3 (commencing with Section 4645) of Chapter 9 of Part 2 of Division 4, in a manner acceptable to the State Forester. It is the intent of the Legislature that title in the aforementioned lands and facilities shall continue to vest in the State of California; and if for any reason their use for the purposes of this chapter be deemed by the department no longer to be in the public interest, then they shall be restored through future legislation to the jurisdiction and control of the Department of Conservation.

5825. The department shall prepare a plan for the protection and management of the center and shall submit the plan to the Legislature, for its consideration, no later than January 15, 1977. The plan shall include, but need not be limited to, the following considerations. (a) Means of ensuring the health, safety and comfort of center users while, at the same time, ensuring that the natural and rustic aspects of the center and its facilities are preserved. (b) The need for providing additional, all-weather lodging, dining and instructional facilities suitable for use by schoolchildren. (c) The protection and utilization of those resources of the center useful for outdoor study. (d) The suitability of the center for public uses, other than outdoor education, appropriate to the state park system. (e) The suitability of the continued use of the center by cultural, social, and youth organizations similar to those which have used the center prior to the effective date of this chapter. (f) The relationship of the center to the Jackson State Forest, Jughandle Creek, Pygmy Forest Park project, Big River project, Mendocino Headlands Park project, and other adjacent or nearby recreational, scientific, or scenic resources, so as to assure optimum public access, use, and enjoyment of such sites and resources. (g) The advisability of transferring or acquiring additional lands so as to ensure the administrative efficiency of the center. (h) The organizational and funding requirements of programs proposed to be undertaken at the center in accordance with this chapter. (i) Estimated utilization rates and the nature and level of fees necessary to make the center program essentially self-sustaining.

5826. The department shall consult with the Department of Education, and may cooperate with individuals and agencies having jurisdiction or expertise in matters pertaining to the outdoor education programs contemplated in this chapter.

5827. The department may enter into operating agreements with any qualified, nonprofit entity for the provision of any program or service contemplated in this chapter. Prior to entering into any such agreement, the department shall submit a copy of the proposed agreement to the Legislative Analyst for his review and recommendations, which shall not, however, be binding. Failure of the Legislative Analyst to respond within 30 days after submission of a proposed agreement shall be deemed to constitute approval by the Legislative Analyst of the proposed agreement.

5828. The department is encouraged to establish an advisory committee of persons interested and knowledgeable in the operation and nature of the center, and in the formulation and conduct of outdoor environmental education programs, to assist it in formulating the plan and actions contemplated in this chapter.

5829. Prior to authorizing the sale and cutting of timber from the area described in subdivision (c) of Section 5823, the State Forester shall solicit and consider the recommendations of the Department of Parks and Recreation with respect to the prevention of unnecessary or unreasonable interruption or loss of facilities or resources essential to center operations.

California Code of Regulations

Chapter 9. State Forests-Use and Sales*

*Formerly Subchapter 8, 9, and 9.1 of Chapter 2, Division 2, Title 14, Cal. Adm. Code.

Subchapter 1. Recreational Use

Article 1. Abbreviations and Definitions

§ 1400. Abbreviations.

The following abbreviations are applicable throughout this Chapter.

- (a) B&M Baseline and Meridian reference lines running in true EW and NS directions used in U. S. General Land Survey
- (b) CAC: California Administrative Code.
- (c) cm: Centimeter(s)
- (d) E: true cardinal direction East
- (e) ha: hectare(s)
- (f) M: meter(s)
- (g) MD: Mount Diablo (used in combination with B&M)
- (h) N: true cardinal direction North
- (i) PRC: Public Resources Code
- (j) R : Range : a row of townships, six miles in width, between two successive meridian lines of the U. S. General Land Survey
- (k) S: true cardinal direction South
- (l) Sec.: Section
- (m) T: Township: a tier of ranges, six miles in length between two successive standard parallels as used in the U. S. General Land Survey

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(n) W: true cardinal direction West

Note: Authority cited: Section 4656.1, Public Resources Code. Reference: Section 4656.1, Public Resources Code.

§ 1400.5. Definitions.

The following definitions are applicable throughout Chapter 9 unless the context clearly requires otherwise.

(a) "Affiliate" means the purchaser's subsidiary, parent company, joint venture partner, entity, being a portion of the conglomerate of which the purchaser is a unit, or other entity under the purchaser's indirect control.

(b) "Board" means the California State Board of Forestry and Fire Protection.

(c) "Campfire" means a fire used by one or more persons while camping, picnicking, recreating or working on state forest land, to provide any one or combination of the following: heat for cooking, heat for personal warmth, light and for ceremonial or aesthetic purposes. "Campfire" includes open fires and those fires contained within fireplaces and enclosed stoves with flues or chimneys, stoves using pressurized liquid or gaseous fluids, portable barbecue pits and braziers or space heating devices which are used outside any structure, trailer house or living accommodations mounted on a motor vehicle.

(d) "Camping" or camp means erecting a tent or shelter or arranging bedding or both, for the purpose of, or in such a way as will permit remaining overnight; or occupying an established campsite with a camper vehicle or camping equipment for the purpose of reserving the use of such campsite. The term also includes parking a camper vehicle or trailer and spending the night within, or within close proximity of said camper vehicle or trailer.

(e) "Designated camping area" means a location designated by the state forest manager as a camping area and marked by authorized signs to that effect. Unless otherwise delineated by fences or signs, a "designated camping area" shall include only the area developed for camping and provided with fireplaces or tables or both, and shall not include any adjacent areas not so developed for camping.

(f) "Department" means the California Department of Forestry.

(g) "Director" means the Director of Forestry.

(h) "person" means and includes natural persons, firms, co-partnerships, corporations, clubs, and all associations or combinations of persons whenever acting for themselves, by agent, servant, or employee.

(i) "Purchaser" means that person, company or entity who was the successful bidder, buyer, transferee or successor of state timber.

(j) "State forest" or forest means any portion of the state forest system administered by the Director.

(k) "State forest licensee" means any person authorized by a state forest manager or the superiors thereof, to engage in any of the following activities within a state forest:

- (1) operate concessions serving the public.
- (2) plant, protect, harvest or remove timber, or other forest products or minerals.
- (3) conduct experiments or otherwise engage in research or educational activity.
- (4) Or any other activity not listed above with written permission of the Director.

(l) "State forest manager" means the state forest officer appointed by the Director to supervise the management and administration of a state forest or in the state forest manager's absence, the person designated by a state forest manager to act during his or her absence.

(m) "State forest officer" means employees of the Department of Forestry as designated by the Director, or such other persons as may be designated by the Director.

(n) "State timber" means any or all trees, logs or wood products from state-owned forests, which have not received primary manufacture to a size sawn on 4 sides to dimensions of 4 inches by 12 inches (10.2 cm by 30.5 cm), or less.

(o) "Substitution" means the replacing of state timber for unprocessed timber which, directly or indirectly, was exported to a foreign country from private lands owned or controlled by the purchaser within California in an area 200 miles (321.8km) or less from the nearest boundary line of the state timber sale area from which state timber was removed. The distance will be determined via the shortest route of either public roads, railroads, or water route customarily used to transport forest products.

Note: Authority cited: Section 4656.1, Public Resources Code. Reference: Section 4656.1, Public Resources Code.

ARTICLE 2. Camping Area Use

§ 1401. Camping Area.

Camping in state forests is restricted to designated camping areas. No person shall camp outside of a designated camping area unless that person or someone in attendance has in their possession a valid state forest campfire and special use permit. Failure to comply with the terms and conditions set forth on said permit shall render it invalid for purposes of this Section.

§ 1402. Campfire Permits.

(a) No person shall prepare, ignite, maintain or use a campfire in any place other than a designated camping area unless that person or someone in attendance has in their possession a valid state forest campfire and special use permit. Failure to comply with the terms and conditions set forth on said permit shall render it invalid for purposes of this Section.

(b) No person shall prepare or ignite a campfire which is or will be unreasonably large and/or dangerous to the surrounding land, or maintain such a fire after having been ordered by a state forest officer to reduce or extinguish it.

(c) No person shall leave a campfire ignited, maintained or used by that person unattended.

§ 1403. Occupancy Time Limits.

No person shall camp within any one state forest more than 14 days in any single visitation. Consistent with Section 4455 of Title 14, California Code of Regulation, General Occupancy by the same persons, equipment, or vehicles of any camping facility is limited to a total of 30 days in any calendar year in that State Forest. Exceptions may be granted by the state forest manager to persons engaged in official state business.

Note: Authority cited: Section 4656.1, Public Resources Code. Reference: Sections 4643, 4645, 4646 and 46546.2, Public Resources Code.

§ 1404. Reservations.

Individual campsites may not be reserved. The term "reserved" includes, but is not limited to, calling or writing in advance to obtain a campsite, a person occupying one or more campsites temporarily until another party arrives, placing camping equipment in a campsite prior to actual occupancy by another party, or other means of obtaining a campsite for a person or persons not actually present in the state forest.

§ 1405. Conduct.

No person shall use threatening, abusive, boisterous, insulting or indecent language or make any indecent gesture in a state forest at such times and in such locations as to disturb other persons; nor shall any person conduct or participate in a disorderly assemblage. Clothing sufficient to conform to common standards of decency shall be worn at all times when the wearer is subject to public view.

§ 1406. Assembly.

No person shall conduct a public assembly or demonstration except on permission of the state forest manager upon finding that the time, place and manner of such activity would not substantially interfere with the use of the state forest by the general public in the applicable area.

Note: Authority cited: Section 4656.1, Public Resources Code. Reference: Sections 4656.1 and 4656.2, Public Resources Code.

ARTICLE 3. GENERAL RESTRICTIONS

§ 1410. Nuisance.

No person shall erect any structure on or allow a campsite occupied by that person to become littered with refuse.

§ 1411. Equipment.

No person shall occupy a site with camping equipment or vehicles prohibited by the state forest manager.

§ 1412. Noise.

No person shall create noise which disturbs others in sleeping quarters or in campgrounds within a state forest between the hours of 11 p.m. and 6 a.m. daily. No person shall, at any time, use electronic equipment (other than that used in forest operations) including electrical speakers, radios, phonographs, or televisions which produces a sound that can be heard at more than 100 feet from the source.

Note: Authority cited: Section 4656.1, Public Resources Code. Reference: Sections 4656.1 and 4656.2, Public Resources Code.

§ 1413. Weapons.

(a) No person shall discharge any firearm, air or gas weapon, or bow and arrow in the vicinity of camps, residence sites, recreation grounds and areas, and over lakes or other bodies of water adjacent to or within such areas, whereby any person is exposed to injury as a result of such discharge.

(b) Without limiting the foregoing, no person shall discharge any of the above named weapons or any other weapon while within 150 yards (137.20 m) of any designated camping area.

§ 1414. Soliciting.

No person shall sell or offer for sale any goods or services within a state forest unless licensed by the state forest manager.

Note: Authority cited: Section 44656.1, Public Resources Code. Reference: Sections 4656.1 and 4656.2, Public Resources Code.

§ 1415. Firewood.

Campers, picnickers and other recreational users may gather dead wood lying on the ground for use within the state forest. No person shall remove firewood or other forest products from any state forests without the written consent of the state forest manager.

§ 1416. Defacing Plants.

(a) No person shall cut or deface live trees, or remove shrubs, plants or portions thereof, or destroy, deface or remove forest products of any description.

(b) Annual fruits of native plants such as gooseberries, elderberries and blackberries may be picked and empty conifer cones may be taken for non-commercial use.

(c) This section shall not apply to state forest licensees when acting within the scope of their authorization.

§ 1417. Geological Features.

No person shall destroy, disturb, mutilate or remove earth, sand, gravel, oil, minerals, rocks or features of caves. This Section shall not apply to state forest licensees when acting within the scope of their authorization.

§ 1418. Horticulture.

In order to control soil erosion, conserve water and preserve the natural condition of state forests, no person shall plant, tend or harvest within a state forest any herbs, flowers, vegetables, or fruits except as permitted by Section 1416(b). This section shall not apply to state forest licensees when acting within the scope of their authorization.

§ 1419. Improvements.

No person shall mutilate, deface, damage or remove any table, bench, building, sign, marker, monument, fence barrier, fountain, faucet, gate, lock, water storage tank or other structure, facility, equipment or property within a state forest.

§ 1420. Unauthorized Signs.

No person shall cut, carve, paint, post or otherwise affix in a state forest any bill, advertisement or inscription on any tree, natural geologic formation, fence, wall, building, monument or other property whether improved or unimproved. This section shall not apply to state forest licensees when acting within the scope of their authorization.

§ 1421. Rubbish.

(a) No person shall leave, deposit, drop or scatter bottles, broken glass, ashes, waste paper, cans or other rubbish in a state forest except in a receptacle designated for that purpose.

(b) Without limiting the foregoing, no person shall vacate campsite without removing all of the above-mentioned refuse thereon and depositing it in a receptacle designed for that purpose.

§ 1422. Polluting Waters.

No person shall deposit, permit to pass into, or willingly allow any substance in any spring, stream, lake or other waters within a state forest which will tend to cause said waters to become unfit for human consumption, deleterious to fish and plant life, or which will destroy the aesthetic qualities of the waters. This section includes, but is not limited to, the washing of clothing or other materials, and the disposal of body or other wastes.

§ 1423. Animal Waste.

Persons keeping dogs, cats, or other animals within designated camping areas are responsible for removing and burying any and all droppings of said animal, and failure to do so within a reasonable time, or upon order of a state forest officer, shall constitute a violation of this Section.

§ 1424. Pets.

(a) No person shall bring a dog, cat or other animal into a designated camping area unless it is confined, or in a vehicle, or upon a leash not longer than 6 feet (1.83 m), or otherwise under physical restrictive control at all times.

(b) No person shall keep within a state forest a dog or other animal which is noisy, vicious, dangerous or disturbing to other persons after having been ordered by a state forest officer to remove said animal from the state forest.

§ 1425. Horses.

(a) No person shall bring saddle, pack or draft animals into a designated camping area unless it has been developed to accommodate them and is posted accordingly.

(b) No horse or other animal shall be hitched to any tree, shrub or structure in such a way that it may cause damage thereto.

(c) Persons bringing animals into a state forest are responsible for providing them with feed, and no person shall allow any saddle, pack or draft animal to graze on any portion of the state forest not specifically designated by the state forest manager as suitable for grazing purposes.

§ 1426. Smoking.

Smoking on state forest land covered with flammable vegetation or ground litter while traveling on foot, cycle or domestic animal is prohibited between April 1 and December 1 of any year, and in areas posted against smoking. Smoking is permitted in the following locations: Within improved campground, inside vehicles on improved roads, in places of habitation, and while stopped in an area of at least 3 feet (0.91 m) in diameter cleared of flammable vegetation and ground litter, provided however when smoking within a 3 foot (0.91 m) clearing that all glowing substances are extinguished and discarded within the cleared area.

§ 1427. Archeological Features.

No person shall collect or remove any object or thing of archeological or historical interest or value, nor shall any person injure, disfigure, deface or destroy the physical site, location or context in which the object or thing of archeological or historical interest or value is found.

Note: Authority cited: Section 4656.1, Public Resources Code. Reference: Sections 4656.1, 4656.2 and 4656.3, Public Resources Code.

ARTICLE 4. VEHICLES

§ 1430. Parking Time Limits.

The state forest manager may by order establish limits of time for the parking, storage, or leaving of vehicles, including trailers, in a state forest and in units or portions thereof. No person shall so park, store or leave a vehicle or trailer in contravention of such orders when such time limits have been posted in the area affected. Nothing herein shall be construed in derogation of other state forest regulations.

§ 1431. Cross-Country Travel Prohibited.

Motor vehicles shall be operated only on roads and in parking areas constructed for motor vehicle use. Trail bikes, motorcycles, jeeps, pickups, and other passenger-carrying motor vehicles shall not be operated on any road or trail posted as closed to the public or to such use.

§ 1432. Speed Limits.

History

1. Repealer filed 2-1-83; effective thirtieth day thereafter (Register 83, No.6).

§ 1433. Vehicles In Camping Areas.

No person shall drive any motorbike, motorcycle or other motor vehicle on any roads within designated camping areas for any purpose other than access to, or egress from the area.

ARTICLE 5. Restricted Use Areas

§ 1435. Areas Closed to Hunting, Trapping, and the Use of Firearms.

The following areas are closed to hunting, trapping, and the use of firearms.

(a) Area in Tulare County.

The area approximately 440 acres (178.068 ha), more or less, located in Tulare County and described as follows: lying north, south, east and west of Balch Park being those parts of Sec. 36, T19S, R 30E, Sec. 31, T19S, R31E, Sec. 6T20S, R31E, and Sec. 1 and 2, T20S, R30E, that are bounded as follows: from the intersection of the north line of said Sec. 1 with the Balch Park road northerly along this road to its junction with the Lace Meadow road; thence easterly along said Lace Meadow road to its intersection with the north line of the SE ¼ of Sec. 36, T19S, R30E; thence east along said line to the Summit road; thence southerly along the Summit road to its junction with the Balch Park road; thence southwesterly along the Balch Park road to its junction with the Bear Creek road; thence southwesterly along the Bear Creek road to its intersection with the south line of Sec. 2 to the old Coburn Mill road; thence along the Coburn Mill road to its intersection with the north line of the SE ¼ of Sec. 2 to the quarter corner between Sec. 1 and 2; thence along the west and north lines of the SE ¼ of the NW ¼ of Sec. 1 to the SW corner of the Balch Park property; and thence easterly and northeasterly, thence easterly, thence northerly, thence westerly, thence southerly, and finally westerly along the boundaries between Balch Park and the Mountain Home State forest to the point of beginning. All townships are described from the MDB&M.

(b) Area in Mendocino County:

The areas located in Mendocino County and described as follows:

(1) Mendocino Woodlands area, approximately 3,000 acres (1214.100 ha), more or less. That portion of Mendocino Woodlands area laying south and east of the Little Lake Mendocino (city) road, and south of Jackson State Forest road 740, being all of Sec. 13 and portions of Secs. 1, 11, 12, 14, 15, 22, 23, and 24 of T17N, R17W, and portions of Secs. 7, 18, 19 and 30 of T17N, R16W, all MDB&M.

(2) Parlin Fork Conservation Camp area, approximately 1,500 acres (607.500 ha), more or less. The E ½ of Sec. 32, T18N, R16W, MDB&M. All of Secs. 33, T18N, R16W, MDB&M. That portion of Sec. 4, T17N, R;16W, MDB&M, lying north of state highway 20.

(3) Chamberlain Creek Conservation Camp area, approximately 1,020 acres (412.794 ha), more or less. All of Sec. 5, T17N, R15W, MDB&M; N ½ of Sec. 8, T17N, R15W, MDB&M; N ½ of Sec. 9, T17N, R15W, MDB&M.

§ 1436. Areas Closed to Hunting and the Use of Firearms.

The following area is closed to hunting and the use of firearms:

(a) Area in Shasta County.

The area of approximately 320 acres (129.504 ha), being a portion of the Latour State Forest immediately surrounding the Latour Forest Headquarters and Forest Fire Station. Said lands being located in Shasta County and being described as follows: lying south and east of Mc Mullen Mountain being the SE ¼ of Sec. 1 and the NE ¼ of Sec. 12, T32N, R2E, MDB&M.

§ 1437. Fire Hazard

History

1. Repealer filed 2-1-83; effective thirtieth day thereafter (Register 83, No. 6).

§ 1438. Temporary Restricted Use.

To insure the safety and health of persons, to avoid interference in development, construction, research and timber management, or to provide for the security, safeguarding and preservation of property within a state forest and portions thereof, a state forest manager or the period of time not to exceed 1 year.

(a) Notices prescribing the prohibited activity shall be posted in such locations as will reasonably bring them to the attention of the public.

(b) No person shall, while in the restricted area, engage in the activity so prohibited.

§ 1439. Temporary Restricted Use.

To insure the safety and health of persons, to avoid interference in development, construction, research and timber management, or to provide for the security, safeguarding and preservation of property within a state forest and portions thereof, a state forest manager or the superiors thereof may order any portions of a state forest closed to public use or entry for a period of time not to exceed 1 year.

(a) A copy of the order shall be posted at the state forest headquarters and may specify such reasonable classes of persons who may enter the closed area in the conduct of such proper activities or official duties as the forest manager or the superiors thereof may prescribe.

(b) Notices designating the area closed to entry shall be posted in such locations as will reasonably bring them to the attention of the public. Such notice may specify the period or periods of closure.

(c) During this period when an area is closed to public entry, only persons specifically authorized by the order of closure may enter or remain within the area so closed.

This section shall not be construed in derogation of any other state forest regulation.

Subchapter 3. Geothermal Development

Article 1. Purpose

§ 1500. Purpose.

History

1. Repealer of subchapter 3, article 1 (section 1500) and section filed 11-7-96; operative 1-1-97 (Register 96, No. 45).

Article 2. Specific Provisions

§ 1501. General Requirements.

History

1. Repealer of subchapter 3, article 2 (sections 1501 through 1503) and section filed 11-7-96; operative 1-1-97 (register 96 No. 45).

§ 1502. Special Requirements.

History'

1. Repealer filed 11-7-96; operative 1-1-97 (Register 96, No. 45).

§ 1503. Consent of Permits or Leases.

1. Repealer filed 11-7-96; operative 1-1-97 (Register 96, No. 45).
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Subchapter 4. Timber Sales

§ 1510. Harvesting and Management.

The harvesting of forest products from state forests and management of state forests shall follow management plans developed for each forest by the Director, and approved by the Board.

Note: Authority cited: Section 4656.1, Public Resources Code. Reference: Sections 4656, 4651, and 4656.1, Public Resources Code.

§ 1511. Timber Sales.

When selling timber from state forests as authorized by PRC 4650-4651, the Director shall comply with the requirements of the Department of General Services and Department of Finance pertaining to the sale of state property. Such timber sales shall be conducted and administered by the Director following procedures promulgated in the State Administrative Manual (SAM) for contracting and sale of state property.

Note: Authority cited: Section 4656.1, Public Resources Code. Reference: Sections 4651 and 4656.1, Public Resources Code.

§ 1515. Bids Solicitation.

The Director, when selling or soliciting bids for sale of timber from state forests, shall condition the sale upon agreement of the purchaser that said timber will not be substituted for timber exported from private lands under control of the bidder, or affiliate.

§ 1516. Non-Substitution Agreement.

Every purchaser of timber from state forests shall execute an agreement with the Director that said timber will not be substituted for timber exported from the purchaser's private land.

§ 1517. Notice of Removal.

The purchaser, before removal of timber from state forests, shall give written notice to the Director of any or all locations where said timber will be processed. Said notice shall be required for all of said timber until such time as the timber has been sawn to dimensions of 4 inches by 12 inches (10.2 cm by 30.5 cm) or less.

§ 1518. Transfer Requirement.

Upon transfer of state timber not receiving primary manufacture, the purchaser shall require the transferee to agree to the same substitution restrictions as are imposed on purchaser. Within 5 days of said transfer, a copy of the agreement, together with location of intended processing of said timber, shall be delivered by purchaser to the Director.

§ 1519. Preservation of Records.

Purchaser shall preserve for a period of 3 years, after conclusion of removal of timber from the state forest, all records pertaining to the use and disposition of the state timber and, upon request of the Director, make said records available for inspection by the Director.

§ 1520. Violation.

History

1. Repealer filed 2-1-83; effective thirtieth day thereafter (Register 83, No. 6).

§ 1521. Notice of Violation and Review.

If the Director determines that a purchaser has violated any provision of these regulations, a Notice of Violation shall be sent certified mail to purchaser with the further statement that purchaser shall be prohibited from purchasing state timber for a period of 5 years from the date of violation and said notice will designate the period of suspension of the timber operator permit, if any, not exceeding a period of 6 months from the date of notice. Within 30 days of said notice, purchaser may make written appeal to the Director for review. The Director, upon his or her option, may act on the appeal either by open hearing or submission of written documents and proof. A decision of the Director is final.

Board of Forestry and Fire Protection Policies February 21, 2001

CHAPTER 0310 - BOARD POWERS AND RESPONSIBILITIES

GENERAL POWERS AND RESPONSIBILITIES 0311

Included within the function of the Board of Forestry and Fire Protection is the power and responsibility to:

D. Represent the State's interest in the acquisition and management of State forests;

COOPERATIVE AGREEMENTS, NURSERY, INSECT CONTROL, LAND GIFTS 0315

Board powers and responsibilities include:

C. Recommend and, if necessary, set conditions for accepting gifts of land for the State Forest System;

STATE FORESTS 0316

Board powers and duties regarding State forests include:

A. Determine approval of Department of Forestry forest management plans in State forests;

B. Recommend and promulgate resolutions for acquisition of State forest properties if it is deemed appropriate;

C. Determine approval of State forest land sales due to unsuitability for forest purposes;

D. Establish rules for the preservation, protection, and use of State forests.

LAND AVAILABILITY 0334.3

In order to maintain timber growing land in California as a permanent source of current and future timber supply, the Board has found that it is in the public interest:

B. To manage all prime timberland on State forests to investigate and demonstrate management for optimum long-run timber production. Where such forest lands contain or adjoin areas of high recreation value in State or other ownership, timber growing and harvesting practices may be modified in order to minimize conflicts between other land uses and to demonstrate the costs and effectiveness of such practices.

CHAPTER 0350 - FOREST MANAGEMENT POLICIES

STATE FORESTS 0351

GENERAL 0351.1

California's State forest system has been in existence since 1946 when the first large forest properties were acquired. Sections 4631-4658 of the Public Resources Code provide the authority for acquisition, administration, and operation of State forests by the Department. Most of these statutes were enacted in 1945 following recommendations of the Forestry Study Committee established by the Legislature in 1943. There are now seven State forests totaling 68,654 acres as shown below:

Staff Working Draft January 19, 2007

STATE FORESTS IN CALIFORNIA - 1982

State Forest	County	Area (Acres)	Date Acquired
Jackson	Mendocino	50,505*	1947-51, 1968
Latour	Shasta	9,013	1946
Mountain Home	Tulare	4, 562	1946
Boggs Mountain	Lake	3,454	1949, 1972
Las Posadas	Napa	796	1929 (gift)
Mount Zion	Amador	164	1932 (gift)
Ellen Pickett	Trinity	100	1939 (gift)

** Mapping accuracy has been improved since this acreage was calculated. The more accurate acreage for Jackson is 48,652 acres.*

Jackson, Latour, Mountain Home, and Boggs Mountain State Forests are commercial timberland areas managed by professional foresters who conduct programs in timber management, recreation, demonstration, and investigation in conformance with detailed management plans. Las Posadas, Mount Zion, and Ellen Pickett State Forests were acquired as gifts to the State and are relatively noncommercial in nature. These smaller forests are used primarily for administrative and recreational purposes and are managed by local Department of Forestry personnel incidental to other responsibilities. Deed restrictions preclude some uses on these forests.

A large acreage of potentially productive timberland in California is not producing a satisfactory growth of young timber. To attain proper management of private timberlands in California, there is a need to investigate, develop, and demonstrate new and improved forest management methods to timberland owners and the public. The State forests serve this purpose while contributing to the economic stability of local communities by providing high yields of forest products which sustain local employment and tax bases. Outdoor recreation is an important public benefit of the state forests.

The significance of the State forest program in demonstrating improved practices will increase as the demand for forest products increases and as public interest in forest management practices intensifies. Demonstrations of the compatibility and conflicts involved in multiple use of forest land are essential as population and development pressures increase on California's forest lands.

The State forests require a stable land base to facilitate long range planning necessary in forest land management. There is an urgent need to preserve the integrity of the existing State forests to assure their continued management according to legislative intent contained in PRC Section 4631. Reduction of private and public inholdings through purchase or exchange is needed to allow more efficient management of the existing State forests. Additional small demonstration forests (under 2,000 acres) adapted to meeting local requirements for investigation, demonstration, and education are needed in those counties where management of small timber ownerships is inadequate and no demonstration forests exist. There may be lands already in State ownership that could partially meet this need.

In consideration of the above facts, the Board of Forestry and Fire Protection has adopted the following policies to guide the Department of Forestry in administering the State forest program and managing the State forests.

PROGRAM PURPOSE AND LAND USE PRIORITIES

0351.2

The primary purpose of the State forest program is to conduct innovative demonstrations, experiments, and education in forest management. All State forests land uses should serve this purpose in some way. In addition:

- A. Timber production will be the primary land use on Jackson, Latour, and Boggs Mountain State Forests. Timber production will be subordinate to recreation on Mountain Home State Forest;
- B. Recreation is recognized as a secondary but compatible land use on Jackson, Latour, and Boggs Mountain State Forests. Recreation is a primary use on Mountain Home State Forest as prescribed by Section 4658, Public Resources Code;
- C. State forest lands may be used for Department administrative sites when such use will benefit State forest programs or protection;
- D. Special uses primarily benefiting non-forestry and/or private interests will have low priority. Such uses that conflict with State forest objectives are discouraged.

DEMONSTRATIONS AND EXPERIMENTS

0351.3

The Board, consistent with PRC Section 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. Accordingly, in the operation of State forests, the Department will:

- A. Conduct a balanced program of demonstrations and investigations in silviculture, mensuration, logging methods, economics, hydrology, protection, and recreation; directed to the needs of the general public, small forest landowners, timber operators and the timber industry.
- B. Continue and develop procedures to assure dissemination of information obtained on State forests to forest landowners, (especially small owners), timber operators, and the general public.
- C. Integrate the Department's Service Forestry Program with State forest demonstration activities to more effectively reach small forest landowners and the general public.
- D. Conduct periodic field tours to exhibit State forest activities and accomplishments to forest industry, small forest landowners, relevant public agencies, and the general public. Field tours should be initiated by the Department and conducted at such times and places to encourage general public attendance.
- E. Seek special funding as needed from the Legislature to support specific research projects on State forests.
- F. Consult with and solicit the cooperation of the State universities and colleges, U.S. Forest Service, and other public and private agencies in conducting studies requiring special knowledge. Enter into cooperative agreements with other public and private agencies for investigating forest management problems of mutual interest. It is particularly of mutual benefit to make the State forests available to educational institutions, and other agencies for research projects.
- G. Cooperate with the Department of Parks and Recreation in establishing forest management demonstration areas compatible with recreation for educational purposes adjacent to the Mendocino Woodlands Outdoor Center on Jackson State Forest.

TIMBER MANAGEMENT

0351.4

Purposes and policies for timber management on state forests are established in PRC Sections 4631 and 4651. The Board has further established the following policies pertaining to management and harvest of timber on State forests:

- A. The Department will conduct regular periodic timber sales on Jackson, Latour, Boggs Mountain, and Mountain Home State Forests. Harvesting may be deferred in accordance with an approved management plan;
- B. A rotation age, cutting cycle, and an allowable annual cut will be established for each State forest from which timber is harvested. Timber harvesting schedules should be projected at least five years into the future;
- C. Allowable cut levels must be derived from pertinent current inventory and growth data;
- D. State forest timberlands will be managed on the sustained yield principle, defined as management which will achieve and maintain continuous timber production consistent with environmental constraints;
- E. State forest timber stands should be harvested on the basis of maximizing mean annual increment of high quality forest products. This should not preclude intermediate cuts designed to increase total yield and reduce losses from mortality;
- F. Timber production and harvesting should provide for coordination with other State forest uses. Silvicultural practices should be compatible with recreation, soil, water, wildlife, and fishery values, and aesthetic enjoyment;
- G. Economically and ecologically justifiable intensified forest management practices to increase total fiber production and timber quality will be pursued on the State forests. These practices will be designed and carried out for maximum applicability (or demonstration values) to private lands. Financing to conduct such intensive silvicultural practices should be actively sought by the Department;
- H. Timber sales should have demonstrational value and include experimental and educational aspects whenever possible.

RECREATION ON STATE FORESTS

0351.5

- A. Recreation is recognized as a secondary, but usually compatible use, on Jackson, Latour, and Boggs Mountain State Forests. Recreation is a primary use on Mountain Home State Forest as prescribed by section 4658, Public Resources Code.
- B. The recreation program on State forests will make camping and day use facilities available to the general public, offer a degree of control and protection to the forests, and demonstrate that recreational use and timber management can be compatible land uses.
- C. Campgrounds, picnic areas, and trails will be developed on State forests, as funds become available, but only consistent with the recreational carrying capacity as determined in the management plan.
- D. Recreation improvements will generally be rustic in character with sanitary facilities and water sources which meet public health requirements. Special attention should be given to maintaining safe and sanitary conditions in all recreation sites utilized by the public.
- E. Recreation use will be integrated with timber management activities to demonstrate how these uses can be compatible. The presence of recreationists on the State forests presents a unique opportunity to explain timber management to the general public.

F. The State forests will remain open for public hunting and fishing in accordance with State Fish and Game regulations except for specified closures required for public safety and forest protection as authorized by law.

SPECIAL USES OF STATE FORESTS

0351.6

Special uses of State forests will be permitted only when there is a clear benefit to the State and when such uses do not conflict with primary (uses) programs of timber management, demonstration, research, and recreation.

A. Use of State forests for mining, grazing, and commercial concessions is discouraged.

B. Although the state Lands commission has primary jurisdiction over geothermal resources on state forests, surface operations of geothermal developers will be strictly controlled by the department in accordance with regulations adopted by the Board contained in 14 CAC Section 1500-1503.

GRANTING TEMPORARY PERMITS FOR PASSAGE

0351.7

It is desirable to grant temporary permits for passage across State forests to forest products operators or other parties having need of them in the course of their operations where such permits do not interfere with the primary uses of State forests by the State. Applications for temporary permits for passage may be made to the Director who will be guided by the following principles in submitting applications to the Director of General services for approval.

A. Temporary permits for passage will be granted on a reciprocal basis where practicable.

B. The State will have free use of all lands and routes over which permits for passage have been granted.

C. The State will reserve the right to cross, recross, and parallel any such lands or routes with its own roads or utilities.

D. Temporary permits for passage will be limited to a minimum economical width but in no case shall exceed 60 feet except for needed cuts and fills.

E. The grantee of any temporary permits for passage will pay the State the current market value of timber necessarily cut or damaged in clearing and construction on State lands, provided that the price and volume will be determined by the Director, and such timber when paid for will belong to the operator.

F. Temporary permits for passage will be of such duration as to meet the reasonable needs of the grantee. Three years' non-use of any permit for passage for the purpose granted will constitute an abandonment forfeiture thereof unless the period of non-use is otherwise agreed upon.

G. The State will be reimbursed for any damage caused to State property in the construction and/or maintenance of such, provided that the grantee will hold the State harmless from any and all liability arising from the construction, maintenance and/or use of areas covered by such permits for passage.

H. Where it appears that benefit will result to the State, any charge for such permit for passage may be reduced accordingly.

I. All slash and snags on the area covered by a permit for passage will be disposed of by the grantee. The grantee will have the same responsibility for fire protection on any such area as is required by the Board for fire protection on a timber operating area.

PERMANENT EASEMENTS ACROSS STATE FOREST LANDS

0351.8

Permanent easements across State forest lands are sometimes necessary to allow adjacent owners access, use and development of their property. Granting of permanent easements across State forest lands can influence the development of subdivision or rural residential complexes which are not in harmony with State forest management activities.

The Board does not support or encourage residential development within State forest boundaries or on lands contiguous with State forest boundaries. The following guidelines will be followed by the Director in considering request for permanent easements:

- A. Requests for permanent easements and widening of existing easements will be discouraged, but may be considered when no other routing through non-State forest land is physically possible or if such other routing presents substantial and unreasonable difficulties or environmental damage;
- B. Requests for permanent easements will be submitted by the applicant in complete and understandable form with appropriate engineering data and plats as may be required by the Director. The applicant will prepare any required environmental documents and bear all administrative costs associated with processing his easement agreement;
- C. Requests for permanent easements will be accompanied by a non-refundable deposit to cover administrative and engineering costs involved in studying the request. The deposit will be applied toward any fees charged if an easement agreement is consummated. This non-refundable deposit will be forfeited by the applicant if for any reason an easement agreement is not granted by the State. All fees may be waived where reciprocity is a consideration;
- D. In those special cases where permanent easements are necessary for subdivision rural residential development, the easement will be accepted by the county as part of the public road system and developed to public road system standards;
- E. To prevent proliferation of roads and easements, parcels with multi-ownerships will be required to share a common easement across State forest lands if at all feasible. This may involve substantial increases in planning, negotiation, engineering and cost to the original applicant;
- F. To maintain control of easement use which could lead to subdivision rural residential development, an effort will be made to formalize by agreement, any prescriptive rights to State forest roads which adjacent owners may have acquired through uncontested use;
- G. Permanent easement requests will be considered for only the minimum width and minimum development needed for the requested use;
- H. A clause will be included in all permanent easement agreements guaranteeing the State all forest management options in areas adjoining privately developed lands without interference from the grantee;
- I The Director will record all permanent easement agreements with the local county.

STATE FOREST LAND ACQUISITION POLICY

0351.9

- A. The State forests should remain intact as management units without further diversion of productive area to non-forestry purposes. There should be no future transfers of commercial timberland from the state forests except where such transfers meet the program objectives of the State forests.
- B. Private and public inholdings within the State forests should be reduced through acquisition or exchange. Irregular property lines should be rectified by acquisition or exchange, where desirable, to facilitate efficient management and to avoid conflicting land uses on adjacent areas. Inholdings and

irregular property lines present an especially acute problem on Mountain Home State Forest which should be resolved as soon as possible. Certain boundary line adjustments would also be desirable on Jackson and Latour State Forests.

C. Public Resources Code Section 4631(c) permits acquisition of "Demonstration forests of 2,000 acres or less adapted to furnish local needs of investigation, demonstration, and education in those timber counties where the ownership pattern is such that management of small areas is an important problem." Existing Department administrative sites involving significant timberland areas should be analyzed to determine if they could be utilized as demonstration state forests. Las Posadas, Mount Zion, and Ellen Pickett State Forests should be studied to determine if they contribute to the State forest program, or if they should be sold or exchanged for areas more suitable for State forest purposes.

STATE FOREST MANAGEMENT PLANS

0351.10

Management Plans for Boggs Mountain, Jackson, Latour, Mountain Home and Soquel Demonstrations State Forests shall be prepared by the Department, with appropriate public review, for approval by the Board. The Department shall present to the Board a thorough review of each existing plan at least every five years. All operations on the forests will conform to the management plans. Management plans should include, but not be limited to the following topics:

The following modification to existing Policy was approved at the Board's regularly scheduled meeting in San Bernardino on July 12, 2001:

"Management Plans for Boggs Mountain, Jackson, Latour, Mountain Home and Soquel Demonstration State Forests shall be prepared by the Department, with appropriate public review, for approval by the Board. The Department shall present to the Board a thorough review of each existing plan at least every five years. After each review, the Board may direct the Department either to continue management under the existing plan, to prepare amendments to the plan, or to prepare a new plan for public review and Board approval. The Department shall submit the requested amendments or plan to the Board within one year after each request. The Department shall continue management under existing plans with appropriate consideration for changes in law or regulation, until amendments or new plans are approved by the Board."

II Special Concern Areas

The term Special Concern Area is used to denote geographically distinct areas that are in some way unique, are designated for specific management, or that are subject to management restrictions to protect sensitive resources. Restricting management in this manner helps to create or retain forest conditions consistent with the goals of the Forest. Figure 5 shows the approximate locations of the Special Concern Areas.

Many Special Concern Areas overlap. Examples include the power line right-of-way crossing through the watercourse and lake protection zone or the uneven-aged management area; the overlap of pygmy forest and the Jughandle Reserve; or road and trail corridors within the Woodlands Special Treatment Area. The acreages shown below are those that are assigned to each Special Concern Area independently; thus, the total of all acres is more than the total Forest acreage affected by Special Concern Areas. The most restrictive limitations will be applied during implementation of the management plan. The research and demonstration mandate coupled with public trust resource protection has resulted in a large number of Special Concern Areas on the Forest, a total of 23.

Old Forest Structure Zone- 6514 acres

Area designated for management to connect specific old-growth groves, late-seral development areas, watercourse protection zones, and upland forest to form a contiguous area of habitat with structural characteristics of older forest, such as large trees, snags, down logs, and a high degree of vertical and horizontal diversity.

Cypress groups - 253 acres

Stands dominated by pygmy cypress that occur on sites with generally unproductive soils (i.e., sites that are considered non-timberland), but not considered to be true pygmy forest. These areas will not be harvested. Note that conifer stands containing cypress that occur on more productive sites may be subject to harvesting and are not included in this Special Concern Area.

Pygmy forest - 613 acres

A unique type of dwarf vegetation found on old marine terraces dominated by pygmy cypress and other specially-adapted species. This Special Concern Area includes nearly all of the Jughandle Reserve Special Concern Area, along with other pygmy forest stands in JDSF that occur outside of the Jughandle Reserve boundaries. These areas will not be harvested.

Jughandle Reserve - 247 acres

An administrative area designated to protect a tract of pygmy forest within JDSF and to manage recreational access to these lands in a manner compatible with human use in the adjacent Jughandle State Reserve. This Special Concern Area lies almost entirely within the pygmy forest Special Concern Area. There will be no harvesting within the pygmy forest area.

Eucalyptus infestation area

This is an area in the Caspar Creek planning watershed that includes eucalyptus species mixed with the native species (Douglas-fir, redwood, and other species), along with some Monterey pine. This is an area of special management concern because of the need to control eucalyptus to allow regeneration of conifers in this stand and to prevent the spread of this exotic species on the Forest. JDSF intends to convert this area to native conifer species.

Inner gorges

Steep slopes adjacent to streams that are that are prone to mass wasting and have a high potential for sediment delivery to stream channels. These areas are subject to silvicultural limitations, such as no harvest or limited single tree selection, depending on the results of a site review during THP preparation.

Northern spotted owl nest areas

Buffers around known nest site locations that will be managed to minimize disturbance to these sites and enhance their value as nesting habitat for the northern spotted owl.

Osprey nest areas

Buffers around known nest site locations that will be managed to minimize disturbance to these sites and enhance their value as nesting habitat for osprey.

Watercourse and lake protection zones (WLPZ) - 7,440 acres

Areas designated for special management to protect aquatic and riparian resources, maintain terrestrial habitat connectivity for wildlife, and promote development of late-successional forest stand conditions. Silviculture is limited to no harvest or special uneven-aged regimes designed to promote development of late-successional forest stand conditions. WLPZ acres were estimated.

Woodlands Special Treatment Area - 2,511 acres

A special management area adjacent to the Mendocino Woodlands. Silvicultural activities, with limited exceptions, are focused on promoting late-successional forest conditions, maintaining aesthetic qualities, and limiting impacts on the operation of Mendocino Woodlands.

Domestic water supplies - 195 acres

Designated areas for domestic water supply in JDSF that are sensitive to disturbance. Only a limited range of silviculture is allowed in these areas.

Buffers adjacent to non-timberland neighbors - 875 acres

Areas along the boundary of JDSF adjacent to non-industrial timberland owners where a buffer zone is designated to minimize impacts on neighbors. Only a limited range of silviculture is allowed in these areas.

Power line right-of-way - 89 acres

Operated by PG&E. The power line right-of-way runs through the Forest, generally parallel to Highway 20. The maintained clearing is not available for timber production.

State Park Special Treatment Areas - 415

Areas adjoining State Parks where the application of silvicultural systems must take the values of the parks into consideration.

Reserved old growth groves - 459 acres

Includes the existing mapped old growth grove reserves. These areas will not be harvested.

Late seral development areas – 2732 acres

Includes areas adjacent to three old growth grove reserves, in addition to the upper Russian Gulch and lower Big River areas, which will be managed to develop late seral habitat conditions potentially suitable for the marbled murrelet. These areas will be managed to promote development of late seral stand conditions to help buffer the adjacent old growth groves and to enhance the value of these areas for wildlife species that are associated with late seral forests.

Campground buffers - 133 acres

Areas immediately adjacent to campgrounds that are managed for public safety and aesthetic enjoyment. Even-aged silviculture is not allowed within the campground buffers.

Conservation camps - 43 acres

Areas occupied by the Parlin Fork and Chamberlain Creek conservation camps. These areas will not be managed for timber production.

Road and trail corridors - 5,020 acres

Buffer areas along trails and roads to maintain aesthetic qualities valued by the public. Only a limited range of silviculture is allowed in these areas.

Parlin Fork management area - 312 acres

An area adjacent to the Parlin Fork Conservation Camp that is used as a demonstration area for small woodland management.

Research areas - 1,680 acres

Areas set aside for various research studies.

Areas with a high relative landslide potential

Areas identified from CGS geology and geomorphology maps as having a high relative landslide potential using the best available data and assessment methodologies. These areas will be reviewed on the ground following the guidelines presented at the 1999 CLFA workshop. They are potentially subject to limitations on road construction, yarding methods, and silviculture and may need to be evaluated by a certified engineering geologist (CEG).

Mushroom Corners Management Area – 330 acres

The Mushroom Corners area partially overlaps the Caspar Experimental Watershed, Russian Gulch/Lower Big River a Late Seral Recruitment area, county roads with visual and recreation concerns, as well as proximity to State Parks and private land ownerships (see Figure 5). This area is particularly important to the mycological research community, in part due to its ease of access and presence and abundance of a diverse number of species.

III Research and Demonstration Program

Proposed Research and Demonstration Priorities

The entities that have made recommendations for research and demonstration in the recent past are listed below along with priority items that they have identified.

Demonstration State Forest Advisory Group (2005-date)

In its February 2006 comment letter to the Board of Forestry and Fire Protection in response to the December 2006 Draft Management Plan and DEIR, the Demonstration State Forest Advisory Group recommended that JDSF "...should be demonstrating the most advanced silvicultural practices, cutting edge research, forward-thinking management for habitat protection, and watershed health." The Group made the following specific recommendations regarding areas of inquiry for research and demonstration:

- How can the conversion of working forests be slowed, in particular what will make the best economic argument to forest landowners?
- What role does a demonstration state forest play in preventing fragmentation of the larger, landscape-scale forest and its function as wildlife habitat, watershed, source of income for a local community, and so on?
- What is the mutuality of revenue generation and demonstration of a working forest and how can this be communicated to the public?
- What environmental services does a state forest provide?
- How can working forests be compatible with and contribute to the quality of life goals of neighbors and communities?
- What are ways to inform and engage state forest neighbors and the interested public in stewardship, such as participatory or all-party monitoring?
- How can silvicultural practices address critical environmental needs while embracing opportunities such as carbon sequestration?
- What is the appropriate technology and level of infrastructure for the state forest, particularly road construction and maintenance?
- What are effective ways to demonstrate contemporary and emerging forest practices, inventory techniques, and so on to small-acreage, non-industrial forest landowners?
- What is the changing face of California demographics, what forest values do citizens hold, and how can the state forest provide this citizenry with relevant demonstrations and appropriate recreation opportunities?
- Are there externalities in environmental advocacy in California, in other words what are we exporting in terms of environmental impacts to those regions harvesting timber and producing products imported to California?

JDSF Citizen's Advisory Committee (1997-1998)

In 1997, former Director Richard Wilson appointed an advisory committee (CAC) to provide advice to the Department during preparation of a habitat conservation plan and management plan. The advisory committee made some specific recommendations to the Department regarding priorities for research and demonstration that included:

- Uneven-Aged Silviculture
- Determination Of Necessary Habitat Elements To Retain Within Managed Stands
- Develop Alternatives To Herbicide Use

- Hardwood Growth And Utilization
- Effects Of All-Aged Management Upon Fish And Wildlife
- Utilization Of Wide Stream Buffers
- Creation Of marbled murrelet Habitat
- Creation of a fully funded scientific monitoring system

Coast Redwood Forest Management Symposium, 1994

A poll of research needs was done during the Coast Redwood Forest Management / Silviculture Conference held in January 1994. This list was developed independent of ranking by clientele group and is as follows:

- Dynamics of group selection
- Management of Riparian / Aquatic Resources
- Growth Modeling of Redwood Forest types - Young Tree
- Demonstration of Sustained Un-even aged Forestry
- Spatial Dynamics of Stand Structure
- Documentation and Synthesis of Existing Information on Coast Redwood Forests
- Documented Demonstration of Management Alternatives and Activities at JDSF
- Habitat and Wildlife Relationships
- Long Term Landscape Level Studies on JDSF (including CWE studies)
- Coppice Management - Long and Short Options and Effects

State Board of Forestry and Fire Protection Committee on Research, 1987

In 1987, the State Board of Forestry and Fire Protection's Committee on Research issued a report that identified critical or urgent research needs in the following areas:

- Cumulative Watershed Effects
- Vegetation and Pest Management
- Landowner Rights And Responsibilities
- Riparian Zone Management
- Forest And Rangeland Fragmentation
- Forest And Rangeland Recreation
- Sediment Yield And Monitoring
- Uneven-Aged Silvicultural Systems
- Wildlife Habitat
- Forest And Rangeland Education
- Public Attitudes
- Multi-Resource Inventories And Database Development

The report stated that "Increased support for research work on these twelve critical and urgent problem areas is needed to meet existing statutory and regulatory requirements, pressures for additional regulation, economic impacts on rural areas, and the long-term resource needs of California's growing population."

U. C. Wildland Resource Center Workshops: UC Center for Forestry

In 1989, the University of California's Wildland Resources Center at Berkeley conducted three workshops to determine critical and urgent research needs and published Report 20 which identified the following:

- Provide Technology For Managing Channels And Aquatic Habitats
- Manage Nonpoint Pollution And Sediment In Streams

- Measure, Predict, And Deal With Cumulative Impacts Of Multiple Harvests
- Produce Maps Of Vegetative Cover And Types At A Resolution Of 1 To 3 Acres
- Improve Methods For Inventorying, Managing Databases, And A Locational GIS
- Define Considerations To Practice Forestry In Populated, Rural-Residential Areas
- Enhance Continuing Education Of Professional Managers Of Forest Resources
- Complete Surveys Of Soils And Related Vegetation And Of Geologic Hazards
- Define Habitat Requirements For Wildlife And Practices To Enhance Populations
- Define Habitat Requirements For Fish And Forestry Practices Favoring Fisheries
- Provide For Management And Rehabilitation Of Unstable Watersheds
- Improve Methods For Assuring Reliable Stocking And Growth Of Plantations
- Provide Methods For Cost-Effective Management Of Weeds
- Establish Efficacy And Safety Of Herbicides

Report on Old Forest Restoration by silviculture experts at U.C. Berkeley, 2003

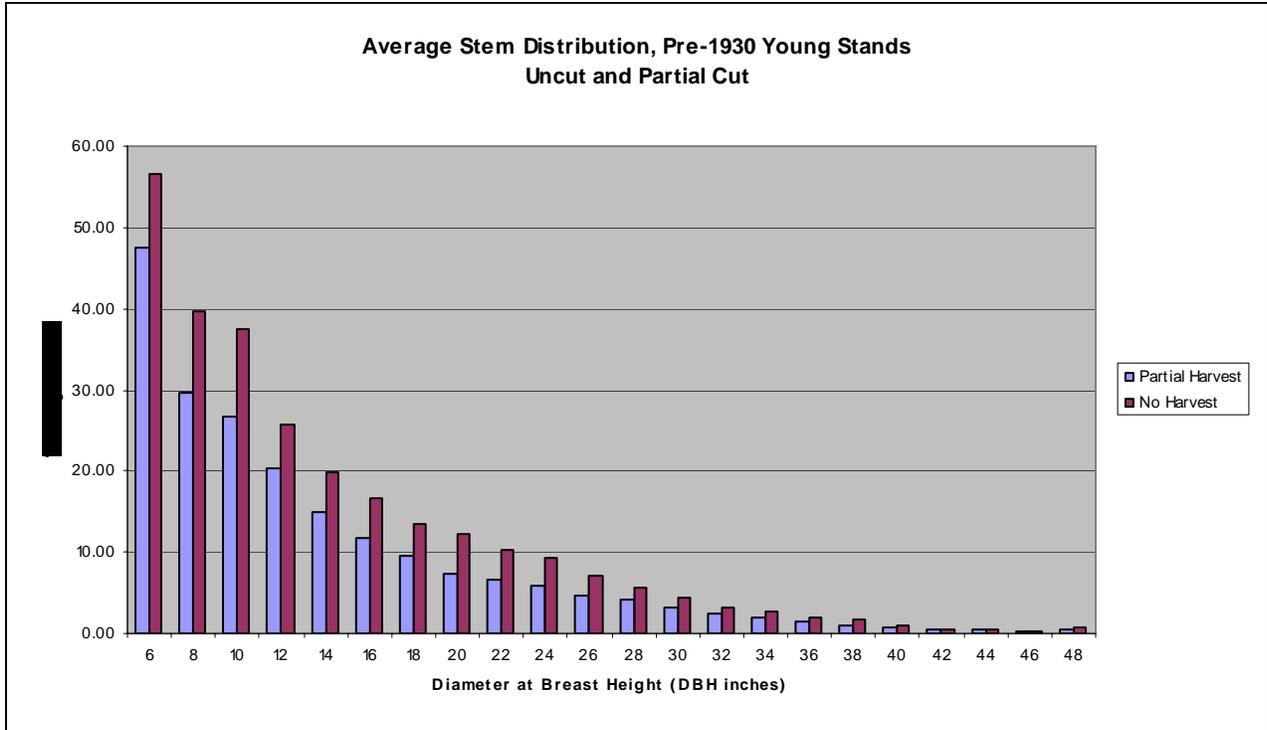
This is an unpublished report titled *Potential for old forest restoration and development of restoration tools in coast redwood: a literature review and synthesis* (Dagley and O'Hara 2003) that presents 9 research priorities. These are summarized below:

- Role of Fire
- The Spatial Structure Of Redwood Clones
- Amount And Distribution Of Leaf Area
- Old Tree Growth Histories
- Redwood Sprouting Dynamics
- Variable Density Thinning Responses
- Gap Size Responses
- Aggregated Versus Dispersed Retention With Variable Retention
- Dead Wood Formation And Longevity

Older Forest Development and Management

The development of older forest structure characteristics on a stand and landscape context is a major component of this plan. The following tables and graphs are derived from research and inventory data on JDSF. They illustrate the feasibility of active management in more rapidly meeting certain structure targets.

This figure shows a comparison of the diameter distribution of uncut and partially cut stands on JDSF. This illustrates that active management can achieve similar results as a no-harvest approach. This comparison is an average across the Forest and does not account for factors such as site and initial density.



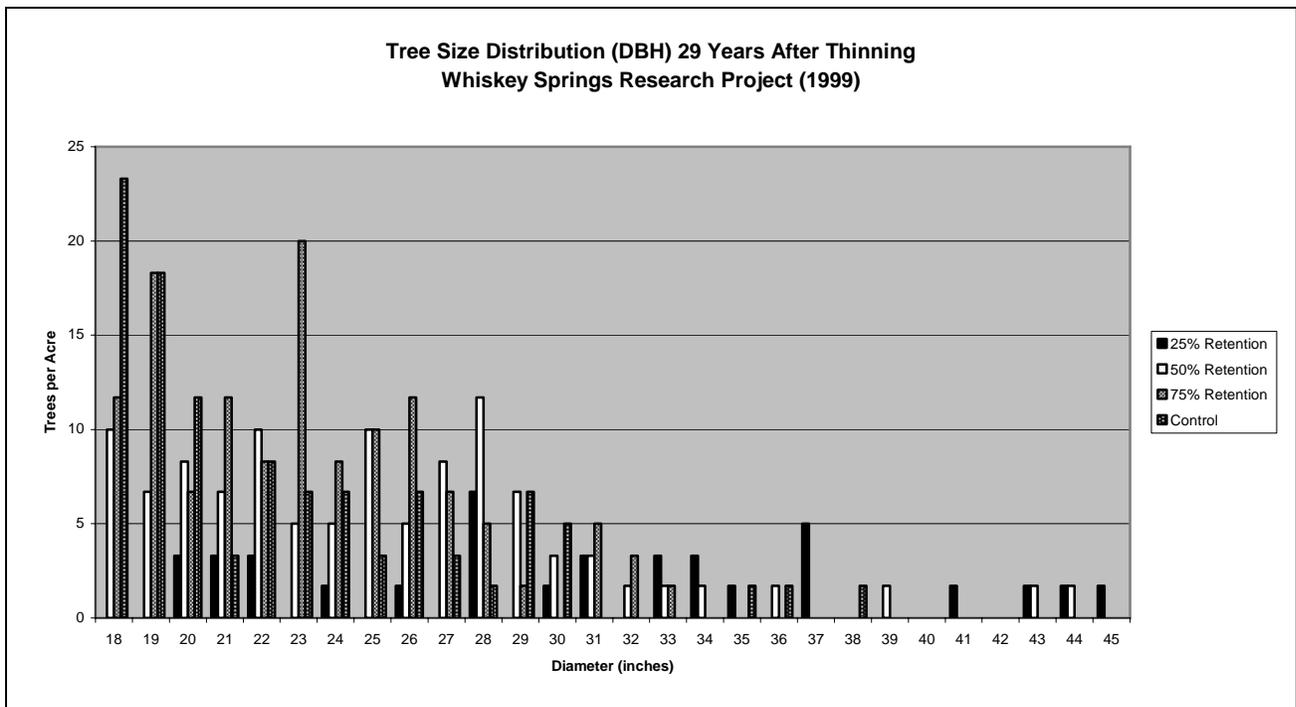
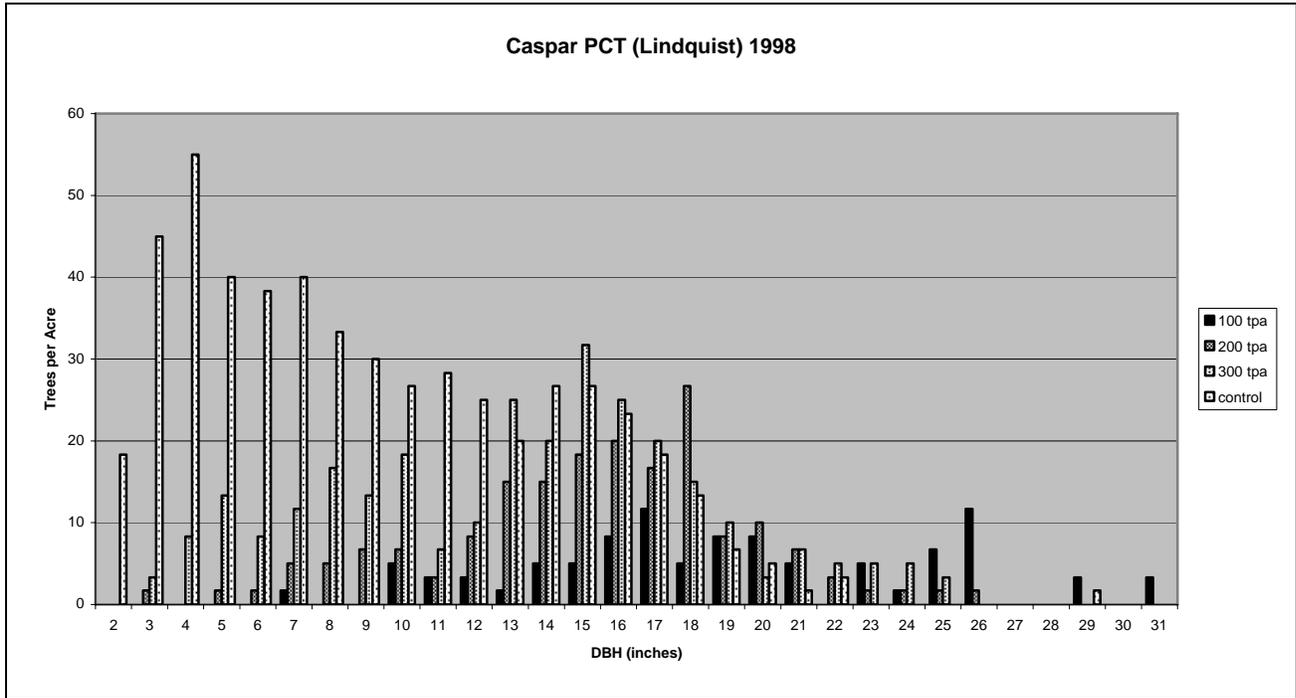
The following tables and their associate graphs show the diameter distributions from two levels-of-growing stock research studies. Both indicate the influence that stocking can have on speeding the development of large trees, which are required elements for other structural components in older stands such as basal hollows and nest platforms.

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Caspar Creek Pre-commercial Thinning Study. Diameter distribution in 1998, 17 years after thinning. Stand age approximately 39 years.				
Diameter	Trees Per Acre			
Class (in.)	100	200	300	UNCUT
2				18.3
3		1.7	3.3	45.0
4			8.3	55.0
5		1.7	13.3	40.0
6		1.7	8.3	38.3
7	1.7	5.0	11.7	40.0
8		5.0	16.7	33.3
9		6.7	13.3	30.0
10	5.0	6.7	18.3	26.7
11	3.3	3.3	6.7	28.3
Subtotal	10	32	100	355
12	3.3	8.3	10.0	25.0
13	1.7	15.0	25.0	20.0
14	5.0	15.0	20.0	26.7
15	5.0	18.3	31.7	26.7
16	8.3	20.0	25.0	23.3
17	11.7	16.7	20.0	18.3
Subtotal	35	93	132	140
18	5.0	26.7	15.0	13.3
19	8.3	8.3	10.0	6.7
20	8.3	10.0	3.3	5.0
21	5.0	6.7	6.7	1.7
22		3.3	5.0	3.3
23	5.0	1.7	5.0	
Subtotal	32	57	45	30
24	1.7	1.7	5.0	
25	6.7	1.7	3.3	
26	11.7	1.7		
27				
28				
29	3.3			1.7
30				
31	3.3			
Subtotal	27	5	8	2
Total	105	187	288	527

Staff Working Draft January 19, 2007

Whiskey Springs Research Project				
Average number of trees per acre by diameter class for each treatment in 1999. Stand age approximately 80 years, 29 years after thinning.				
Diameter Class (in.)	Basal Area Retention			
	25%	50%	75%	100%
5	0.0	0.0	0.0	20.0
6	0.0	0.0	0.0	35.0
7	0.0	0.0	0.0	50.0
8	0.0	0.0	0.0	35.0
9	0.0	0.0	6.7	35.0
10	0.0	0.0	5.0	38.3
11	0.0	0.0	11.7	26.7
12	0.0	0.0	13.3	36.7
13	0.0	0.0	15.0	33.3
14	0.0	0.0	11.7	26.7
15	0.0	0.0	8.3	8.3
16	0.0	1.7	16.7	33.3
17	0.0	6.7	15.0	11.7
Subtotal	0	8	103	390
18	0.0	10.0	11.7	23.3
19	0.0	6.7	18.3	18.3
20	3.3	8.3	6.7	11.7
21	3.3	6.7	11.7	3.3
22	3.3	10.0	8.3	8.3
23	0.0	5.0	20.0	6.7
Subtotal	10	47	77	72
24	1.7	5.0	8.3	6.7
25	0.0	10.0	10.0	3.3
26	1.7	5.0	11.7	6.7
27	0.0	8.3	6.7	3.3
28	6.7	11.7	5.0	1.7
29	0.0	6.7	1.7	6.7
Subtotal	10	47	43	28
30	1.7	3.3	0.0	5.0
31	3.3	3.3	5.0	0.0
32	0.0	1.7	3.3	0.0
33	3.3	1.7	1.7	0.0
34	3.3	1.7	0.0	0.0
35	1.7	0.0	0.0	1.7
Subtotal	13	12	10	7
36	0.0	1.7	0.0	1.7
37	5.0	0.0	0.0	0.0
38	0.0	0.0	0.0	1.7
39	0.0	1.7	0.0	0.0
40	0.0	0.0	0.0	0.0
41	1.7	0.0	0.0	0.0
42	0.0	0.0	0.0	0.0
43	1.7	1.7	0.0	0.0
44	1.7	1.7	0.0	0.0
45	1.7	0.0	0.0	0.0
Subtotal	12	7	0	3
TOTAL	45	121	233	500



Active Research Projects

The Caspar Creek Watershed Study

This cooperative study with PSW – Redwood Sciences Lab started in 1962 and is now in the third phase of the study. This project began as a long-term cooperative investigation of the effects of logging and road construction on water quality, flood peaks and suspended sediment. This study added monitoring and assessing aquatic habitat and fish populations before and after harvesting in a cooperative effort with California Department of Fish and Game. The project study expanded in 1985 to evaluate the cumulative watershed effects of clearcuts that were skyline logged in the North Fork. Attributes assessed included total precipitation, soil moisture, groundwater, subsurface pipe flow, stream flow, suspended sediment, bedload movement, channel stabilization, large woody debris, and anadromous fish habitat. The third phase focuses now back on the South Fork Caspar – the former treated watershed in the first phase – where the effects of road abandonment and harvest reentry can be monitored and assessed. To that end, nine gauging stations are being installed in various tributaries in the South Fork to begin the necessary pre-treatment baseline data. A major conference reporting on the results of the second phase was presented in 1998 along with the following proceedings: Proceedings of the Conference on Coastal Watersheds: the Caspar Creek story, 1998 May 6; Ukiah, California. General Tech. Rep. PSW GTR-168. Albany, California: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture

The Caspar Creek Third Growth Pre-Commercial Thinning Study

This study was sited on the 14 acre clearcut unit of the Caspar Cutting Trials in 198. A replicated design of five residual stocking levels(100, 150, 200, 250, 300 stems/ac) plus controls was implemented for the purpose of evaluating the long term stand response of PCT work at stand age 20 in coast redwood. Several newsletter articles and *California Forestry Report #2* have reported on results and results have also been reported on at the Conference on Coast Redwood Forest Ecology and Management in 1996, a technical session presented in spring 2000, and at the 2004 Redwood Science Symposium.

The Whiskey Springs Commercial Thinning Study

This study was started in 1970 and the study objective was to monitor and determine the effects of 3 levels of thinning on stand growth and yield in a 40 year old second growth stand of coast redwood and Douglas-fir. The study was initially part of a larger set of study areas however it is the only one left intact. The study area has been remeasured many times over the life of the study and has evolved to monitoring also the sprout regeneration resulting from the initial thinning under the 2 heaviest thinning treatments. A sub-study evaluating the effects of pre-commercial thinning on these new sprouts was also initiated. Several reports and newsletter articles have resulted from this study and results have also been reported on at the Conference on Coast Redwood Forest Ecology and Management in 1996, a technical session presented in spring 2000, and at the 2004 Redwood Science Symposium. The last remeasurement occurred in 1999 resulting in *California Forestry Report #3*.

The Effect of Silvicultural System and Stocking Level on Productivity, Costs and Site Disturbance – The Railroad Gulch Silvicultural Study

Laid out over 270 acres, this study in the Woodlands area of the state forest was designed to evaluate the long term effect on stand growth and yield of several levels of single tree and group selection sited on large (20 ac.) blocks. The first re-measurement occurred in the early 1990's with the anticipation that a 10 year harvest reentry would be done. This was not accomplished so in year 2000 a third re-measurement was conducted. Several newsletter articles and California Forestry Note 97 have resulted from this study and the first harvest entry and growth results were presented at the Conference on Coast Redwood Forest Ecology and Management in 1996. A master's thesis was completed from the

implementation and completion of the initial phase of this project. Professor Kevin O'Hara and graduate student Pascal Berrill from UC Berkeley are currently using this study for redwood silviculture research.

Developing a Coast Redwood Growth Model for Use in Making Silvicultural Prescriptions

This study which involved several phases builds upon much agricultural and botanical research in applying those results to timber stand growth modeling. The two variables of interest are the trees leaf surface area (LSA) and its net assimilation rate (NAR). The two researchers have used these two variables to develop the relationship between tree growing space and tree growth. Through the development of thinning prescriptions called the triangular thinning method, stand growth in an asymmetrical spaced stand can achieve growth increment comparable to a symmetrically spaced stand. A distant dependent type growth model called GPSACE was developed which computes the stand and tree growth based on the configuration of the trees within the stand for coast redwood in the 120-140 foot class. Several JDSF newsletters have reported on this study and a Ph.D. dissertation was also completed with the completion of the project. This study is approaching the end of the period needed to allow the trees to adjust to their new growing space. At some future date, the next phase would be to compare actual growth rates against GSPACE model predictions.

Hare Creek Sprout Stocking Study

Plots were established in a new clearcut to establish a baseline measurement for long term monitoring as the stand develops. The objective is to document stand growth and yield with the effects of management actions such as pre-commercial and commercial thinning through the length of the rotation. Publication of California Forestry Note 102 presented the results of the study to that point in time. Another re-measurement was completed prior to a pre-commercial thinning activity in 1998 and in the following year a post thinning re-measurement was completed.

Determination of the Value of Advance Regeneration in Redwood/Douglas-fir Overstory Removal

Plots were established to evaluate survival of large advance regeneration resulting from partial cutting in second growth stands 20 years earlier, following a third entry focused on a removal of the residual overstory. A contract report is on file.

Large Woody Debris (LWD) Studies On Jackson Demonstration State Forest

The first study in cooperation with the Department of Fish and Game started in 1996. The purpose was to introduce large woody material to the stream channel to determine if higher quality habitat could be produced for anadromous salmonids. Other study reaches are now sited also in Caspar Creek and Hare Creek. Installation and preliminary results have been published in several JDSF newsletters and a presentation was made at the Technical Session in 2000.

Incision of Low-Order Stream Channels

This study will provide for a reconnaissance of a wide range of stream channels on the Forest to formulate and improve hypotheses concerning the factors that influence the occurrence of gully headcuts and incision in low-order channels and swales.

Completed Major Research Projects

Investigation of the Black Stain Root Rot Disease

Studies have been conducted on the prevalence of the disease on the north coast and modes of transmission from tree to tree as well as the various environmental factors that may contribute to the incidence of the disease.

The Response of Algal Communities in Streams on JDSF to Timber Harvesting

Sampling streams in logged and unlogged basins showed significant differences in filamentous algae.

Forest and Fire Technology Transfer

A self guided interpretive/demonstrational trail system in the Woodlands area was developed with an accompanying illustrated brochure ("Forest History Trail Guide").

Factors Affecting Natural Regeneration in Second Growth Redwood Stands Following a Selection Harvest

Regeneration data in cut-over second growth stands was collected. A doctoral thesis was written as part of this project

James Creek Rock Ripper Tilling Trial

A study implemented to evaluate the usefulness and effectiveness of tilling compacted skid trails using conventional rock rippers and medium sized crawler tractors. This was done in conjunction with the harvesting of the James Creek 1983 timber sale.

Hare Creek Winged Subsoiler Tilling Trial

The project objective was to demonstrate the effectiveness of tilling skid trails for site rehabilitation using winged rippers versus the conventional method of waterbarring.

New Inventory Design Development and Plot Installation

The implementation of the new forest inventory plot system (IFI) done in 1988-89. Partial remeasurements have also been done in 1997 and 1999. The design allows for upwards of 5000 potential inventory plot sites with approximately 2400 plots currently proportionately allocated according to vegetation type requirements of which about 300 are new permanent plots. The old permanent CFI plots have been incorporated into the new design by using the center one fifth acre circular portion of the original one-half acre rectangular plot.

Survival and Growth of One Year Bare Root, Two Year Bare Root and One Year Container Redwood Seedlings

This study was implemented to test the various stock types available for artificial regeneration and make recommendations for the relative chance of plantation establishment for these three types. The chosen sites were located in the group selection units of the Railroad Gulch timber sale which was harvested for implementation of a silvicultural study. A contract report is on file. This project has resulted in a paper in the Western Journal of Applied Forestry (Jameson and Robards, In Press).

East End Vegetation Management

State Forest staff designed a study to test several different types and combinations of mechanical and chemical brush control treatments in the James Creek drainage. A vegetation management firm was contracted to apply the treatments.

Hare Creek 80 Pre-Constructed Skid Trail Study

This study was part of an active timber sale and was designed to evaluate two skidding strategies: 1. Preplanned skidtrail layout before felling and 2. "Loggers choice " where skid trails are constructed after felling is completed. A JDSF Newsletter reported on the results.

Camp 20 Visitor Center Development

A visitor center kiosk was constructed at Camp 20. Through a contract with Chico State University, nine interpretive sign displays were developed for the visitor center, including a steam donkey display. New skids were made for the steam donkey and new center sign and restroom were also developed. Additionally, a pedestrian bridge crossing Chamberlain Creek was installed to allow easy access to the Little Red Schoolhouse. Development was reported in a JDSF newsletter.

Fall and Buck Study for CRYPTOS Calibration

A sample of trees representative of local size class distributions and site characteristics were selected throughout the forest to test whether the regional volume equations used by the CRYPTOS growth model were representative of JDSF stands. Results indicated that the model equations overestimated redwood and Douglas –fir tree volumes by about 6 percent while other whitewoods were underestimated by approximately 3 percent. Appropriate calibration coefficients are now being applied to the equations when using the model. Results were reported in a JDSF newsletter. Fall and buck tree data is on file and has been released when requested.

Baseline Surveys of Birds, Mammals, Amphibians, and Reptiles and Basic WHR Analysis of Wildlife on the Jackson Demonstration State Forest

As a first step in understanding the impact of forest management on wildlife diversity, baseline information needs to be gathered on wildlife populations on the forest that is being managed. The primary focus of this study was to provide such information on the birds, mammals, and reptiles on the JDSF. Indices of relative abundance were developed for as many species as possible in as many timber types in the time frame allowed for the study

Analysis of Small Animal Populations in Clear Cut Areas of the Jackson Demonstration State Forest

The purpose of this study was to 1) obtain quantitative data on small mammal populations in areas harvested by clear cutting and control areas; 2) obtain descriptive, quantitative data of site factors and vegetative cover and; 3) quantify population dynamics over time. Small mammal includes all intermediate-sized species that are known to be important prey for predatory birds such as the Spotted Owl.

Vegetation Succession on Clear Cut Redwood Stands of the Jackson Demonstration State Forest

The purpose of this study was to relate the temporal and spatial successional complexes found in coast redwood clear-cuts to environmental conditions and management variables such as harvesting technique and post-harvest management. Harvesting techniques included both tractor and cable while post-harvest actions included burning and herbicide applications. Environmental variables considered were age since

cutting, slope, soils, and rainfall. Eighteen clearcut harvest units were studied using circular quadrates and standard vegetation sampling methods. Two old growth stands in the area were used as controls.

Effects of Commercial Harvesting of Mushrooms on Mushroom Productivity and on the Mycorrhizae

Management and biological concerns about the extensive harvesting of edible mushrooms have necessitated the need for collection of baseline data to assist in developing management guidelines. The specific objectives were to 1) identify botanic types and forest types in which commercially harvested mushrooms are to be found within JDSF; 2) identification of the average yield of the resource and its value; 3) identification of appropriate harvesting times based on both environmental and life-span data.

Redwood Sprouts On Jackson Demonstration State Forest

The objectives of this long term study were to monitor and assess: 1) the growth and development of redwood sprouts growing on a wide range of redwood stump size and age classes, 2) the percentage of sprouting occurring in each size or age class, and 3) effects of thinning sprout clumps under different levels of stocking and available light. The thinning study started in 1950 and has been remeasured in 1963 and 1983.

Cooperative Forest Fertilization Trials

In cooperation with UC extension and other large timberland owners, this cooperative was started in 1970 to determine whether a redwood/Douglas-fir stand in association with other species would respond by a significant growth increase to fertilizer treatment.

Seasonal Diameter Growth In Trees On Jackson Demonstration State Forest

This study was initiated with the start of the CFI (continuous forest inventory) system to determine the best times to perform inventory work and to accurately compute the number of growing seasons between measurements for growth computations.

Development Of Stocking Guidelines And Growth Response Relationships For Multi-aged Silviculture In Coast Redwood

The purpose of this study was to develop an alternative to clearcutting that also avoids the complexity of classical selection systems. This entails the creation of two or three-age class stands. However, no existing guidelines exist for implementation of these structures in the coast redwood type. Final Report received December, 2003 titled "Predicting Multi-aged Coast Redwood Stand Growth and Yield Using Leaf Area Allocation". Also named Redwood MASAM report (Multi-aged Stocking Assessment Model). The following journal articles are from this effort: Stancioiu and O'Hara (2005), Berrill and O'Hara (2003), and Waring and O'Hara (2006).

Assessment And Recommendations For Young Growth Site Index Models And Stand Site Estimation Procedure In California

This study was designed to provide the best set of site index estimation procedures for as many species as possible refined by regional and site specific factors within the limits of available data and any supplementary data collected as part of this project. Final report received. Published as CDF – Forestry Report No. 4, April 2005 titled "Site Index Systems for Major Young-Growth Forest and Woodland species in Northern California".

A Multi-Scaled Analysis Of Fire History, Jackson Demonstration State Forest

The purpose of this study was to reconstruct the spatial and temporal occurrence of past fire events including baseline data on fire frequency, timing, severity, spatial patterning, and seasonality that is necessary to develop prescribed fire, silvicultural, and management programs. Final report received December, 2001, Published in Northwest Science, Vol 77, No.2, 2003. Presented at the Redwood Region Forest Science Symposium, Rohnert Park, Ca. March, 2004.

A Predictive Transport Model For Large Woody Debris In Forest Streams

The purpose of this study was to develop a repeatable methodology which assesses the probability of wood movement in streams under a given distribution of flows. This is a necessary part of computing a long term wood budget for planning sufficient LWD loading in riparian corridors. Final report received in January, 2003 titled " A Theoretical Model for the Initiation of Large Woody Debris Movement in Caspar Creek, CA".

Evaluating Long-Term Sediment Storage And Transport In The South Fork Noyo River Watershed, Jackson Demonstration State Forest

This study assessed the fluvial geomorphology and the locations and amounts of stored sediment. The information was used to evaluate the influence of management practices on the past and present distribution of sediment within the basin and to develop better constraints for sediment budget analysis. Final Report received 2001. Published by the CDF - State Forests Program June, 2001. Presented at the Redwood Region Forest Science Symposium, Rohnert Park, Ca. March, 2004.

Genetic Architecture Of Sequoia Sempervirens At Jackson Demonstration State Forest

This study was designed to determine if the levels of cloning and genetic diversity are significantly different on various sites. This will improve information used for the evaluation of the impacts of harvesting on reproduction and genetic diversity. The authors (Douhovnikoff, Cheng et al. 2004) published a paper in the American Journal of Botany detailing the results of this project.

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IV Timber Resource Information

This appendix contains background and reference information related to forest management.

Inventory

Table A5-1 is a summary of the 1997 IFI inventory. Table A5-2 is based on soil survey data.

Table A5-1. Timber inventory volumes and vegetation types on the east and west ends of JDSF.

	Vegetation Type	Site Class	Acres	Conifer Volume(bf/ac)	Hardwood Vol(bf/ac)	All Species Vol(bf/ac)	Conifer Total (bdft)	Hardwoods Total (bdft)	All Species Total (bdft)
E	BR	3	22.96	10	6	16	229.6	138	367
E	BR	4	7.08	9	5	14	63.72	35	99
E	BR	8	33.1	8	5	13	264.8	166	430
E	DR5DM	2	479.03	26	2	28	12454.78	958	13413
E	DR5DM	3	777.71	25	2	27	19442.75	1555	20998
E	DR5DM	4	364.77	23	2	25	8389.71	730	9119
E	DR5EM	2	191.64	28	2	30	5365.92	383	5749
E	DR5EM	3	169.56	27	1	28	4578.12	170	4748
E	DR5EM	4	216.01	27	1	28	5832.27	216	6048
E	DR5PM	3	288.04	8	3	11	2304.32	864	3168
E	DR5PM	4	545.05	8	2	10	4360.4	1090	5450
E	DR6DM	3	54.48	47	6	53	2560.56	327	2887
E	DR6DM	4	85.6	46	6	52	3937.6	514	4451
E	GRBG	2	32.95	0	0	0	0	0	0
E	GRBG	3	26.88	0	0	0	0	0	0
E	GRBG	4	5.3	0	0	0	0	0	0
E	HC3E	2	123.67	14	6	20	1731.38	742	2473
E	HC3E	3	1056.93	14	5	19	14797.02	5285	20082
E	HC3E	4	523.74	14	5	19	7332.36	2619	9951
E	HR3E	2	269.91	10	3	13	2699.1	810	3509
E	HR3E	3	1186.86	9	3	12	10681.74	3561	14242
E	HR3E	4	1447.74	9	3	12	13029.66	4343	17373
E	MC5DM	2	4.91	19	5	24	93.29	25	118
E	MC5DM	3	49.33	19	5	24	937.27	247	1184
E	MC5DM	4	31.71	19	5	24	602.49	159	761
E	R5MM	2	13.76	6	3	9	82.56	41	124
E	R5MM	3	92.97	6	3	9	557.82	279	837
E	R5MM	4	68.49	6	3	9	410.94	205	616
E	R6DM	2	164.35	33	3	36	5423.55	493	5917
E	R6DM	3	398.78	32	3	35	12760.96	1196	13957
E	R6DM	4	169.44	32	3	35	5422.08	508	5930
E	R6MM	2	6.84	26	2	28	177.84	14	192
E	R6MM	3	93.81	25	2	27	2345.25	188	2533

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	Vegetation Type	Site Class	Acres	Conifer Volume(bf/ac)	Hardwood Vol(bf/ac)	All Species Vol(bf/ac)	Conifer Total (bdft)	Hardwoods Total (bdft)	All Species Total (bdft)
E	R6MM	4	252.91	25	2	27	6322.75	506	6829
E	RD2M	3	8.57	27	0	27	231.39	0	231
E	RD5PM	2	106.11	17	3	20	1803.87	318	2122
E	RD5PM	3	159.21	16	3	19	2547.36	478	3025
E	RD5PM	4	43.43	16	3	19	694.88	130	825
E	RD6E	2	45.6	42	2	44	1915.2	91	2006
E	RD6E	3	104.82	42	2	44	4402.44	210	4612
E	RD6E	4	24.68	42	2	44	1036.56	49	1086
E	RD6EM	2	41.98	23	4	27	965.54	168	1133
E	RD6EM	3	743.48	23	4	27	17100.04	2974	20074
E	RD6EM	4	720.8	22	3	25	15857.6	2162	18020
E	RD6MM	2	173.75	15	4	19	2606.25	695	3301
E	RD6MM	3	474	14	4	18	6636	1896	8532
E	RD6MM	4	664.95	13	3	16	8644.35	1995	10639
E	RD6PM	2	429.63	24	3	27	10311.12	1289	11600
E	RD6PM	3	1443.78	23	2	25	33206.94	2888	36094
E	RD6PM	4	1161.45	23	2	25	26713.35	2323	29036
W	AL	2	13.07	20	6	26	261.4	78	340
W	AL	3	6.66	19	6	25	126.54	40	166
W	AL	8	37.64	19	6	25	715.16	226	941
W	CPC5E	3	359.12	36	0	36	12928.32	0	12928
W	CPC5E	8	262.96	34	0	34	8940.64	0	8941
W	DR5DM	2	2164.94	61	2	63	132061.3	4330	136391
W	DR5DM	3	926.52	59	2	61	54664.68	1853	56518
W	DR5DM	4	343.63	56	2	58	19243.28	687	19931
W	DR5EM	2	673.97	46	1	47	31002.62	674	31677
W	DR5EM	3	104.69	44	0	44	4606.36	0	4606
W	DR5EM	4	75.99	42	0	42	3191.58	0	3192
W	GRBG	2	93.69	0	0	0	0	0	0
W	GRBG	3	38.46	0	0	0	0	0	0
W	GRBG	8	17.21	0	0	0	0	0	0
W	GSEL	1	7.98	65	0	65	518.7	0	519
W	GSEL	2	1285.99	62	0	62	79731.38	0	79731
W	GSEL	3	75.53	60	0	60	4531.8	0	4532
W	HC3E	2	95.97	39	5	44	3742.83	480	4223
W	HC3E	3	59.76	39	5	44	2330.64	299	2629
W	HC3E	4	17.05	38	5	43	647.9	85	733
W	HR3E	2	461.23	42	6	48	19371.66	2767	22139
W	HR3E	3	124.22	40	6	46	4968.8	745	5714
W	HR3E	4	324.65	39	5	44	12661.35	1623	14285
W	MC5DM	2	37.45	50	0	50	1872.5	0	1873
W	MC5DM	3	113.97	48	0	48	5470.56	0	5471
W	PYGMY	8	612.67	1	0	1	612.67	0	613
W	R6DM	1	25.08	66	2	68	1655.28	50	1705
W	R6DM	2	2055.62	64	2	66	131559.7	4111	135671
W	R6DM	3	1023.77	62	2	64	63473.74	2048	65521

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	Vegetation Type	Site Class	Acres	Conifer Volume(bf/ac)	Hardwood Vol(bf/ac)	All Species Vol(bf/ac)	Conifer Total (bdft)	Hardwoods Total (bdft)	All Species Total (bdft)
W	R6DM	4	79.07	60	1	61	4744.2	79	4823
W	R6MM	1	22.62	69	3	72	1560.78	68	1629
W	R6MM	2	2362.49	66	2	68	155924.3	4725	160649
W	R6MM	3	478.44	64	2	66	30620.16	957	31577
W	R6MM	4	137.65	62	2	64	8534.3	275	8810
W	RD1	2	94.15	0	0	0	0	0	0
W	RD1	3	16.35	0	0	0	0	0	0
W	RD2EO	2	26.76	27	1	28	722.52	27	749
W	RD2EO	3	33.83	27	1	28	913.41	34	947
W	RD2M	2	1523.82	17	0	17	25904.94	0	25905
W	RD2M	3	99.57	17	0	17	1692.69	0	1693
W	RD3P	2	598.21	5	0	5	2991.05	0	2991
W	RD3P	3	4.65	5	0	5	23.25	0	23
W	RD5PM	2	1462.15	49	2	51	71645.35	2924	74570
W	RD5PM	3	139.44	47	1	48	6553.68	139	6693
W	RD6DM	2	28.34	86	0	86	2437.24	0	2437
W	RD6DM	3	76.05	85	0	85	6464.25	0	6464
W	RD6DM	4	22	84	0	84	1848	0	1848
W	RD6E	2	296.38	49	0	49	14522.62	0	14523
W	RD6E	3	126.16	48	0	48	6055.68	0	6056
W	RD6E	4	15.53	47	0	47	729.91	0	730
W	RD6EM	2	2420.24	70	1	71	169416.8	2420	171837
W	RD6EM	3	1131.56	68	1	69	76946.08	1132	78078
W	RD6EM	4	39.93	66	1	67	2635.38	40	2675
W	RD6MM	2	800.36	33	2	35	26411.88	1601	28013
W	RD6MM	3	223.8	32	2	34	7161.6	448	7609
W	RD6MM	4	231.42	31	2	33	7174.02	463	7637
W	RD6PM	1	119.6	55	1	56	6578	120	6698
W	RD6PM	2	6449.97	53	1	54	341848.4	6450	348298
W	RD6PM	3	2397.05	51	1	52	122249.6	2397	124647
W	RD6PM	4	152.37	50	1	51	7618.5	152	7771
			48652				2002685.50	90577.72	2093263.22

Table A5-2. Acres by site class on the east and west ends of JDSF.

Site Class	West End	East End
1	165.6	0
2	22832.3	2077.1
3	7731.3	7209.3
4	1409.1	6288.1
N	911.2	27.2
Total	33049.5	15601.7

V Road Management Plan

Introduction and Background

Forest roads on JDSF are used for timber harvesting, forest management activities, forest protection, public access, and recreation¹⁰. Numerous studies have shown that forest roads are a major source of management-related stream sediment (Furniss et al. 1991). Much of this sediment originates from points at which or near where streams are crossed by roads, from inside ditches, and from large fill failures. The Management Plan for JDSF includes a program to inventory and improve its road system. Additionally, the plan provides guidelines for new road construction. The goal of this program is to protect and enhance stream channel conditions for anadromous fish, amphibians, and other sediment sensitive aquatic organisms by reducing both fine and coarse sediment loading. Implementation of this plan will also improve water quality by reducing suspended sediment concentrations and turbidity. The Road Management Plan includes the following components:

1. Road Network and Stream Crossing Inventory: A plan to inventory roads, road-related facilities, and potential hazards associated with roads.
2. Road Design and Construction Standards: Guidelines for road location, design, and construction.
3. Road Use Restrictions: Guidelines that identify restrictions on use of roads, particularly during wet weather conditions.
4. Road Inspection and Maintenance Program: Guidelines for monitoring Forest roads and establishing a maintenance program.
5. Road Abandonment Plan: A comprehensive plan to identify and prioritize roads to be properly abandoned (i.e., closed or decommissioned).
6. Schedule for the Road Management Plan: A timeline for completion of the road inventory and a method to prioritize the road improvement and abandonment work included as part of the Road Management Plan.

Inventorizing and improving the Forest's roads to reduce sediment yield are needed due to the legacy of a road network partially relying on out-dated drainage systems and old segments located along watercourse channels. The current road network reflects a history of various transportation technologies and forest practices. Beginning in the 1870s, railroads were used to transport logs in some watersheds; many railroad grades were located along or adjacent to streambeds. Current Forest roads still use remnants of the old railroad grades in several places. Most of the roads on JDSF, however, were constructed from the 1950's to the 1970's. Roads constructed during this period generally included inboard ditches and cross drains. Concentrated runoff from these types of roads has been shown to be a major source of fine sediment, because

¹⁰ Note that CDF has no jurisdiction over Highway 20 (Caltrans responsibility), Road 408 and 409 (Mendocino County), Simpson Lane, and other minor county roads within the Forest boundary. Some State Forest roads, notably Roads 300 and 800, are the subjects of formal road use agreements with other parties, the terms of which constrain the State's road management options in specific ways.

the inboard ditches are often connected directly to channels that can carry the sediment to fish-bearing streams (Wemple et al. 1996).

In summary, the intent of this Road Management Plan is to provide a systematic program to ensure that the design, construction, use, maintenance, surfacing, and abandonment of the Forest's roads, landings, and road crossings will be conducted to avoid, minimize, or mitigate adverse impacts to aquatic habitats that support anadromous fish, amphibians, and other aquatic organisms. Additional benefits may be the long-term reduction in the costs of repairs as a result of problem avoidance and reduction of the overall road mileage, and improving functionality of the transportation system because roads will be in better condition and road failures will be less frequent.

The Road and Stream Crossing Inventory

The inventory of roads and stream crossings will provide the basis for maintaining and mitigating the road system. It will allow the managers to: a) identify problems that can be corrected through routine maintenance activities; b) assign maintenance and mitigation priorities to planning watersheds, road segments, and crossings; c) identify the most effective designs for roads, landings, and culvert problem sites; and d) identify roads to be properly abandoned. The inventory will include an intensive evaluation of all roads and crossings.

To the extent feasible, during the first three years of Plan implementation, all existing roads will be inventoried. JDSF estimates that there are approximately 350 miles of actively used roads on the Forest, with another 150 miles of potentially improperly abandoned roads. CDF or a qualified contractor will inventory all roads currently or formerly used for truck traffic. Therefore, approximately 120 miles of road per year will be inventoried. The road network inventory will include both a general road segment component and a separate stream crossing component.

1.1 The Road Inventory Methodology

The basic components for the road inventory procedure for JDSF are as follows (see Weaver (1997) for a detailed description of these components):

1. In the office, a series of aerial photographs taken over time will be analyzed to record the location of all historic and actively used roads for potential road improvement or abandonment work. This is a relatively low-cost, rapid assessment which will be completed for the entire road network in the first year of the program. Multiple sets of aerial photographs will be used for this task, allowing historic roads to be identified that may require proper abandonment.
2. In the field, approximately 33 percent of the Forest's roads will be inventoried each year of the plan's first 3 years (including the first year of the program when the aerial photo analysis is completed).
3. In the office, road segments will be mapped so that they are easily identifiable in the field according to relatively uniform characteristics related to sediment generation. The road segments will also be entered into the Forest's GIS database.
4. Road inventory work will be implemented by planning watershed (i.e., the entire planning watershed will be inventoried prior to beginning the next lower priority planning watershed). The location of critical anadromous fish habitat and estimates of current

sediment delivery to watercourse channels will be used to determine the order of priority for road inventory work among planning watersheds.

5. Using the prioritization schedule, road segments within the selected planning watershed(s) will be traversed in the field and information will be recorded, identifying significant road-related features. This part of the program will be a relatively rapid survey to determine where the problem sites are located. Field crews will be trained prior to undertaking this task and supervised by JDSF personnel familiar with hillslope erosion and mass wasting inventory procedures.
6. Following this reconnaissance level screening, Forest staff will develop site-specific mitigation measures for identified significant potential or existing problems¹¹. The approximate volume of sediment that will be prevented from entering watercourses following implementation of the mitigation projects will be documented.

The basic unit for the JDSF road survey will be the “road segment”. Field inventories will require road segments to be easily mapped. Therefore, road segments will be chosen so that at least one end is easily identified on a map and on the ground. For example, these types of locations include road junctions and stream crossings. If possible, a road segment should be a length of road that is relatively uniform with respect to its attributes that influence sediment production. These may include drainage characteristics, roadbed characteristics, cuts and fills, geomorphic characteristics of underlying terrain, intensity of use, slope, etc. Segments will vary in length depending on the above attributes. Segments may be subdivided following the completion of the field reconnaissance if appropriate.

To facilitate mapping road segments, each road segment will be given a unique identifier. The identifier will be written on the map at the beginning and end of the road segment (Rice 1993). As a convention, the marker adjacent to the easily identified end is underscored on the map. During the initial inventory, information is collected in the field beginning at this end of the road segment. Field crews will document the location of important road features along a road segment.

1.2 The Field Data Sheets for Roads

For each identified segment, a Field Survey Sheet will be filled out. The road survey and crossing survey (discussed below) will be carried out simultaneously, and the roads and crossings will be cross-referenced. For example, each culvert will be identified by its associated road segment(s), and each road segment data sheet will list the culverts in (or at the end of) the segment. Information from the field data sheets will be entered into a database, which will be linked to the GIS through the road segment numbering system.

The following explanations apply to the individual items in the data sheets for the road survey (note that the actual information collected in the field may change over time as the forms are field tested and improved):

Descriptive Information

“Road name”, “planning watershed”, and “segment identification number” can be determined from map information before going into the field. “Length of segment” should be determined in the field. Under usage category, high (“H”) applies to roads used more than once per day during the summer; medium (“M”) to roads used less than once per

¹¹ Certified Engineering Geologists (CEGs) or other appropriately licensed engineers or earth scientists will be used where evaluation of unstable areas requires geologic and/or other specialized expertise.

day, and light (“L”) to roads used less than once per month. (Forest patrol staff will be consulted to help estimate usage.) “Seasonality” refers to intended period of use; if someone has driven on a seasonal road in wet weather the category does not change.

I. Road Drainage

The terms used in this section are illustrated in Figure 1. Note that culvert information is included here as well as in the culvert survey. “Water Breaks” include both waterbars and rolling dips, and the type should be indicated.

II. Road Ditchline Draining to Watercourses

The length of road inside ditch that contributes flow directly to either a Class I, II, or III watercourse will be recorded in feet.

III. Road Bed

“Width of the Bed” refers to the shoulder-to-shoulder distance, from the top of the cut to the toe of the fill (i.e., not just the running surface). The “dominant and maximum road grades” should be estimated in percent. Road segments are intended to have relatively uniform grade. If rills are numerous throughout the segment, their presence will be documented. (Recent grading may eliminate evidence of rilling, in which case this potential sediment source will be recorded as unassessable).

IV. Cutslope

“Parent material” refers to the native rock; the field team should be able to identify sandstone, shale, chert, etc.¹² “Strength” and “weathering” should be designated qualitatively as high, medium or low. Cutslope parent material should be identified as fractured, sheared, or tectonically shattered (CEG to define terms for reconnaissance team). “Cover Density” refers to the percent plant cover. “Estimated gradient” and “estimated height” should be given as ranges and averages for the segment.

V. Fillslope

Fillslope conditions should also be estimated ranges and averages for the segment¹³

VI. Mass Wasting Features

Mass wasting features such as fillslope and cutslope failures, and indicators of potential larger slope failures such as cracks associated with perched fill and organic debris in fill, will be noted as part of the road inventory.

VII. Sediment Delivery Hazard Areas

Portions of roads or landings adjacent to Class I and II watercourses that have steep slopes and/or little filter strip potential will be identified. These deserve special treatment during road closure and maintenance activities.

VIII. Access Control

The presence, operating condition, and maintenance needs of gates or other access-control facilities will be noted.

1.3 The Crossing Survey

Inadequate and decaying culverts can be major causes of sediment problems. Poorly designed culverts can be blocked by woody debris or sediment, which can cause the road to be overtopped and the fill to be eroded (Furniss et al. 1998, Flanagan et al. 1998). Culverts, including cross

¹² CGS watershed geologic maps should be consulted to assist in identifying parent material.

¹³ Fillslopes associated with older roads will be covered with trees and their extent will be difficult to determine precisely. The dimensions recorded will be rough estimates.

drains, draining onto unprotected fill, or “shotgun” culverts with outlets elevated above grade, can initiate gullies. To function properly, culverts must be periodically inspected and maintained. The Crossing Survey will develop a database with information on all crossings within JDSF, including culverts, bridges, fords, Humboldt crossings, and ditch relief cross drains. Recommendations to remove, enlarge, or repair crossings will be recorded.

Drainage structures also include waterbars and rolling dips (collectively called “water breaks”). These structures are not included in the crossing survey since their locations may vary from year to year, depending upon road grading and maintenance. Instead, their location in a road segment will be noted in the road survey.

1.4 The Crossing Survey Form

Each crossing will be assigned a unique number and its location will be noted on a map in the field. Information from the field sheets will be entered into a database, and the culvert locations and ID numbers entered into the GIS. The database will allow the managers to sort by watershed, stream class, channel distance to Class I streams, severity of problems, etc. In addition, the field inspectors will “red-flag” data sheets for culverts that require immediate attention, so that treatment of problems will not have to await the completion of the survey.

Terms used in the Survey Form refer to the following:

Crossing Type

Typical crossing types are abbreviated as follows:

CMPR	corrugated metal pipe (round)—specify if aluminum or galvanized steel and diameter in inches
CMPO	corrugated metal pipe (open bottom)—specify if aluminum or galvanized steel
CMPA	corrugated metal pipe (arch)
RCP	reinforced concrete pipe
RC Box	reinforced concrete box culvert
CPP	corrugated plastic pipe
Open	fill totally removed
BRD	bridge—specify if rail car, timber, log stringer, etc., and length
FORD	ford—specify base, concrete, gravel, sand, cobble, silt, etc.

If more than one culvert of the same type is present, the number should be indicated.

Upstream Channel Dimensions

Active channel width above the crossing entrance (upstream of any backwater effects).

¹⁴

Entrance Type

¹⁴ Research in northern California suggests that culverts with diameters at least 0.7 times the active channel width will pass 95 percent of the woody debris greater than 30 cm long, as well as the 100-year discharge (Flanagan 1996). Generally some training is necessary to consistently recognize the bankfull and active channel widths.

Maximum Head

Maximum head refers to the height (ft) from the bottom of the culvert inlet to the overflow elevation at the road crest.

Rustline Depth

The rustline in a galvanized steel culvert indicates the approximate depth of winter baseflow (note that this does not work for plastic or aluminum culverts).¹⁵

Diversion Potential

Diversion of water from plugged culverts can be a major source of damage. The path water would follow from the road to an active stream channel if the culvert were blocked should be noted.

Outlet

The dissipation of energy of the water as it leaves the culvert is important in controlling erosion.

Percent Dented/Crushed and Percent Filled

Estimate the percentage of the culvert cross-sectional area lost due to mechanical damage or sediment filling.

Alignment and Grade

Inadequate culvert alignment or gradient will be noted as part of the field inventory (i.e., where alignment varies from that of the natural channel).

Fish Passage

Obvious problems for fish passage will be noted on the field forms. Examples of problem situations include: 1) too steep of gradient, creating excessive velocity, 2) too much drop from culvert outlet to pool below, creating a jump too high, 3) no resting pool below culvert, and 4) inadequate water height over pipe bottom (Evans and Johnston 1980).

2. Standards and Guidelines for Design and Construction of Forest Roads, Landings, and Crossings

Road, landing, and crossing design will follow or exceed the current state of the practice, such as is described in *The Handbook for Forest and Ranch Roads* by Weaver and Hagans (1994)¹⁶, or as suggested by JDSF RPFs and CEGs where a timber harvesting plan (THP) has been submitted. Some of the fundamental considerations in planning, design, construction, and reconstruction from the Weaver and Hagans Handbook are described below. Over time, improvements in road design, construction materials, surfacing materials, construction, and maintenance techniques are likely to continue. JDSF will take advantage of these innovations, as appropriate, to assure that impacts to aquatic habitats are minimized. The “demonstration” mandate of the Forest may lead to cases where an experimental design for roads, landings, and crossings do not match the specifications in this document or the current state of the practice.

2.1 Planning

¹⁵ The flow indicated by the rustline is equaled or exceeded about 10 percent of the time on an annual basis. If the rustline is higher than about one-third of the culvert diameter, the culvert may be undersized (Flanagan and Furniss 1996); if it is less than 8 inches above the bottom, the culvert may not be passable for fish. The rustline should be measured at the culvert outlet.

¹⁶ There are some minor exceptions. Road grades associated with new construction are at times steeper than suggested in order to overcome difficult terrain situations. Also, backhoes are not used to construct inside ditches and bridges are not used as extensively as suggested in the Handbook.

Careful planning is essential for the development of an efficient and environmentally sound road system. The average road density in the planning watersheds draining JDSF is 4.9 miles per square mile. Road density by planning watershed ranges from 2.6 to 6.7 miles per square mile for roads that currently can be driven. Roads with the highest potential to adversely affect watercourses will be properly abandoned where possible, if they are not needed as part of the seasonal or year-round road network. New roads will generally be located on or near ridge lines. The goal for planning the final transportation network will be to establish roads in low risk locations that will accommodate appropriate yarding and silvicultural systems, and serve other programs such as recreation and protection. However, a specific road density target will not be used.

The planning watersheds draining JDSF with the greatest potential for road-related impacts include Lower Big River, Chamberlain Creek, Caspar Creek, Kass Creek, and Lower North Fork Big River. Together with the road and crossing inventory, this information will help guide decisions on where to focus efforts to reduce sediment generation from roads (e.g., proper road abandonment or improvement of existing roads). High-risk watersheds will have the highest priority for proper road abandonment work, as well as for improvement projects on road segments that will remain in the permanent road transportation network.

The road construction, maintenance, and rehabilitation standards specified in this Management Plan will help prevent significant adverse impacts to aquatic habitats. Because of the mitigation measures included in this Plan, road density will not be constrained. Measures include, but are not limited to: 1) a comprehensive wet-weather use restriction plan that JDSF staff believe has been effective over several years; 2) a commitment to monitor all active roads on an annual basis, providing a feedback mechanism for road maintenance and improvements; and 3) development of a detailed GIS database to record data about road features collected during the monitoring efforts.

Planning for the JDSF road network is based on the following principles:

- The protection of aquatic resources is a major objective of the Road Management Plan.
- The total mileage of roads will be minimized through basin-wide planning.
- Existing roads will be used wherever appropriate, in preference to building new roads. Substandard roads with drainage and sediment production problems will be reconstructed, re-graded, re-aligned, resurfaced, or otherwise treated to prevent sediment delivery to watercourses, or they will be abandoned properly.
- New roads will be designed to the minimum width necessary to safely accommodate required traffic, with turnouts spaced appropriately for the road class. All roads will be classified according to expected use (high, medium or light), and maintained accordingly.
- New roads will generally be located to avoid unstable terrain, and to minimize ground disturbance and watercourse crossings. Roads in unstable areas, including inner gorge areas, will only be built if an assessment by a CEG confirms that the proposed construction is unlikely to result in mass wasting that would contribute sediment to a watercourse.
- Maps showing mass wasting hazards, including shallow landslide instability, deep seated instability, and inner gorge areas, will be used as guides to avoid unstable ground and to indicate the need for input from an engineering geologist in the design and location of roads.

2.2 Design of Roads, Landings, and Crossings

Proper road, landing, and crossing design is the key to minimizing both the costs of construction and maintenance and environmental damage. The following are the key design principles for roads, landings and watercourse crossings that will be followed by JDSF:

- On slopes over 50 percent, road design for hillslope stability will depend on site specific conditions.
- New and reconstructed roads and landings will generally be outsloped for surface drainage; inboard ditches will be avoided except where unavoidable. Where such ditches exist and are determined to be significant sediment sources, they will be eliminated over time if possible.
- Compared to waterbars, rolling dips are more resistant to traffic induced failures and will be used where possible for surface drainage. Other road drainage structures will be used in some situations, such as existing crowned main-line roads with acceptable numbers of cross drains. On temporary roads that are “put to bed” and will not be driven on for several decades, except in very rare cases, all culverts will be removed when they are abandoned and all drainage facilities will be substantial enough to not require maintenance.
- Roads intended for year-round log hauling use will be surfaced to reduce erosion potential. Surfacing agents include, but are not limited to: rock, chip seal, and asphalt paving.
- Watercourse crossings will be designed to accommodate a 100-year runoff event, as well as for wood and sediment passage. Appropriate sizing techniques include USGS regional regression equations, rational method, flow frequency analysis, and flow transference (i.e., scaling discharge by watershed area from gaging station records, using a regional regression coefficient for watershed area—see Waananen and Crippen 1977). The preferred method is to use more than one office-based technique to determine discharge, and then check this result against field observations (Cafferata et al. 2000).
- Watercourse crossings will be designed to minimize diversion potential. Fill volume will be minimized over crossings, while providing sufficient depth of fill to protect a culvert from crushing under truck traffic.
- Watercourse crossings using culverts with diameters of 60 inches or more will have armored entrances and outflows if they are necessary to avoid substantial loss of fill material.
- Crossings of Class I streams will be designed to provide for fish passage (all life stages). Where possible, bridges or pipe arches will be used to facilitate fish passage.¹⁷ A schedule will be developed to improve existing crossings on Class I watercourses that do not currently provide adequate passage for all life stages of fish.
- Rock-lined ford crossings will be used for Class II and III watercourse crossings where appropriate, since their failure rate is much lower than for culverts (Spittler 1992). Approaches to fords will be rocked to prevent sediment delivery to watercourse channels. It is only possible to use rock-reinforced fords in locations where channel gradients and slopes are moderate to low. This type of structure is most applicable to channels that flow only in direct response to rainfall. For each proposed rock-lined dry ford, the THP should identify the construction design needed to minimize the potential for contributing sediment to watercourse channels. Information appropriate for proper design includes: 1) the channel geometry above the immediate zone of influence of the crossing site, 2) the size of the boulders that are stable within steep pitches of the channel, and 3) the thickness of fill needed for the crossing.

¹⁷ It is necessary to consider the hydraulics of fish crossings in considerably more detail than has been in the past.

- Landings will be designed for minimum safe working size, and care will be exercised in selecting stable sites for construction. This includes avoiding: a) inner gorge slopes and slopes over 50 percent; b) steep headwall swales; and c) narrow ridge-tops between steep swales.

2.3 Construction and Reconstruction

Without proper planning and execution, construction activities may cause serious water quality and sediment problems. The following principles apply to road construction activities on JDSF lands:

- Construction activities that involve significant soil disturbance (such as excavation for roads and landings) will be conducted when soils are not saturated. Culverts and bridges will be installed during the dry period of the year. Material disturbed during construction will be stabilized to prevent movement into watercourses.
- Crossings will be installed in a manner that will avoid input of significant amounts of sediment to the stream.
- Disturbance to the bed and banks of streams will be avoided or minimized.
- New roads in Watercourse and Lake Protection Zones will be avoided, except for approved watercourse crossings and crossing approaches.
- The organic layer of soil, or other organic material such as tree stumps and branches, will not be incorporated within or beneath the road fill.
- The JDSF archaeological database will be checked to determine the location of known archaeological sites before construction and maintenance work is started. These sites will be protected and left undamaged. The specific procedures to protect archaeological sites are addressed in the Forest Management Plan.

3. Road Use Restrictions

Wet weather operations on Jackson Demonstration State Forest will be minimized. In addition, the following guidelines will dictate how dust abatement and water drafting for dust abatement are conducted on the Forest. The following techniques will be used:

- No log hauling will occur if greater than 0.25 inch of precipitation has fallen at the CDF office in Fort Bragg during the preceding 24 hour period. This applies to the entire year. This practice has been used during the winter period on JDSF for approximately 10 years and has proven to be effective in reducing sediment input from active haul roads to nearby watercourses.
- Hauling can resume only after rain has ceased for 24 hours and no road-related turbid water is observed in inside ditches along the roads where hauling may occur.
- Log hauling will not occur when "pumping" of fines from the road surface produces sediment that enters inside ditches and causes turbid water to flow in ditchlines with direct access to watercourses.

- Only surfaced roads will be considered for wet weather log truck traffic. If road rock begins to significantly break down, wet weather use of that road will cease until the road is adequately repaired.
- Roads located in WLPZs will be seasonally closed, or they will be surfaced if they are subject to moderate to heavy log truck traffic during wet weather.
- Blading roads to reduce surface moisture conditions for improving driveability for log trucks is discouraged and will be evaluated on a site specific basis. Blading of roads to allow log hauling will be allowed only for very short distances (for example, on the order of 500 feet per mile of haul road). Blading to control surface moisture will not be allowed on WLPZ roads, and material developed during the blading process on other types of roads will be deposited in safe locations with no access to watercourses, and situated so it can be incorporated into the road's running surface as soon as possible.
- Gates on seasonal roads on the Forest will be locked when road surface conditions merit closure. Roads are gated to prevent environmental and safety hazards.
- Roads actively used for hauling during the dry period of the year will be treated to reduce the generation of road dust. Generally this will mean watering the roads as needed; chemical treatments might also be employed in certain situations.
- Water drafting for dust abatement will occur in off-channel areas when practicable.
- Water drafting from Class I and II watercourses for dust abatement on Forest roads, or for other uses, will require that the following measures are followed: 1) all water intakes are properly screened to prevent harming small fish; 2) points of access for drafting are described and mapped in the THP; and 3) a general description of the drafting requirements is provided in the THP (i.e., time of year, estimated total volume needed, estimated total uptake rate and filling time, and associated water drafting activities from other THPs). On watercourses where the RPF has estimated that bypass flows are less than 2 cfs, or pool volume at the drafting site would be reduced by 10 percent, or diversion rate exceeds 350 gpm, or diversion rate exceeds 10 percent of the above surface flow, no drafting will occur unless the RPF prepares a water drafting plan that is reviewed by CDFG and approved by the CDF Director (see CCR 916.9 (s) for specific language to be followed and CDF 1997 for additional information).

4. Road Inspection and Maintenance Program

Proper maintenance is the key to reducing the long-term contribution of sediment from roads to stream systems. The maintenance program at JDSF will be based on the road and culvert survey (described above) and the inspection program (described below), which will provide the information base for establishing maintenance priorities.

4.1 Principles of the Inspection Program

- Abandoned roads, including temporary roads in a THP that are abandoned after harvest operations, will be inspected at least twice following the completion of the decommissioning activities. The first inspection will follow the first winter after decommissioning. The second inspection will occur after five over-wintering periods (this should provide approximately a 75 percent chance of having at least one strong stressing storm event capable of producing mass wasting features, based on Durgin et al. 1989). If significant problems are found,

equipment will be used to rehabilitate the site properly, if feasible and practical to do so. Following this work, another inspection will be made after the first over-wintering period following equipment use to determine if the improvements are properly functioning.

- In addition to the detailed road and crossing inventory (see Section 1), active roads and crossings (i.e., roads that have not been properly abandoned) will be inspected once annually to ensure that drainage facilities and structures are properly functioning. Two types of inspections will be used: 1) formal inspections, and 2) rapid ad hoc inspections. During formal inspections, all crossings and roads will be carefully observed every two years and problem sites will be recorded on road/crossing inventory forms. To cover the period between detailed inspections, a rapid ad hoc inspection will be made at least once by JDSF Foresters or other staff. Only obvious problems will be determined with the rapid ad hoc inspections. Both types of inspections will cover permanent and seasonal roads. Information collected on road problems during either the detailed formal review or the rapid observation review will be entered into the road database that will be developed for the Forest, and maintenance personnel will be advised immediately of important hazards. Identified problems will be corrected before the onset of wet weather whenever possible and appropriate, depending on availability of personnel and equipment. Failed culverts will be evaluated to determine the cause of failure.
- Problem facilities (including currently known sites and those identified in road/culvert survey) will be monitored by JDSF foresters more frequently during the winter period. The foresters will report problem sites to a maintenance crew, who will make repairs as needed and as staff and material are available. This “storm patrol inspection” will be triggered by the first winter storm event that produces a stressing storm of 2.0 feet stage at the South Fork Caspar Creek weir (this generally occurs 4-6 times a winter).¹⁸ The first winter storm event of this intensity generally occurs after the fall period when soils are recharged with approximately 10 inches of precipitation. Subsequent large storm events may also trigger storm patrol inspections. Persistent problem sites will be prioritized for redesign and upgrading.

4.2 Principles of the Maintenance Program

- Maintenance will be scheduled on an “as needed” basis (including sites located from storm patrol inspections and the rapid ad hoc road inspection process), as well as determined by the formal road inspection that occurs on a two-year cycle.
- During normal road maintenance that does not relate to identified problem sites, excessive grading of running surfaces, inside ditches, and cutslopes will be avoided. Additionally, when possible, vegetation will be left on or above cutslopes to stabilize the slope. Vegetation may be removed on or above cutslopes when: 1) it is necessary to improve visibility and promote safe travel on the road, or 2) hazardous trees may fall on the roadway.
- Hazard zones (e.g., where roads are adjacent to watercourses and there is a high sediment delivery potential) identified during the road inventory or the inspections will be highlighted and maintenance personnel will be advised to use alternative maintenance procedures that might be necessary to prevent further disturbance (e.g., carrying graded material farther down the road prism rather than side-casting into streamside areas).

¹⁸ Use the following website to check stage heights at the South Fork Caspar Creek weir:
http://www.rsl.psw.fs.fed.us/cgi-bin/get_form.cgi.

5. Road Abandonment Plan

Temporary roads can be defined as roads that are used for one or two years, and then “put to bed” with proper road closure. They may be reopened and reused in the next entry. Properly abandoned roads are defined as roads that have been permanently closed in a manner that prevents erosion, maintains hillslope stability, and re-establishes natural drainage patterns. In the California Forest Practice Rules, abandonment means “leaving a logging road reasonably impassable to standard production four wheel drive highway vehicles, and leaving a logging road and landings in a condition which provides for long-term functioning of erosion controls with little or no continuing maintenance.” Similarly, as defined in Weaver and Hagans (1994), proper or proactive road abandonment (i.e., closure or road decommissioning) is a method of closing a road so that regular maintenance is no longer needed and future erosion is largely prevented.

Some roads on JDSF are improperly abandoned roads and may continue to act as sediment sources. These types of roads were simply “walked away from” without proper maintenance or closure. Typically, these roads were blocked and left to grow over with vegetation. Some of these may still present sediment risks to watercourses (e.g., crossings in place, perched fills). A proactive abandonment program includes treating these types of improperly abandoned roads to reduce potential or currently occurring sources of sediment. Proactive road abandonment usually involves removing watercourse crossings and associated fills, removing unstable road and landing fills, and providing for erosion resistant drainage. The focus of proactive road abandonment is to aggressively treat road segments that have the greatest potential to erode and deliver sediment to stream channels.

All roads on JDSF that are no longer required for management and recreation purposes will be evaluated for proactive abandonment, and closure treatments that do not result in increased, overall sediment production over a long-term period (i.e., decades) will be implemented. Sometimes, more damage can result from soil disturbance and destruction of vegetative cover already in place, when compared to the benefits of removing old crossings, etc. Therefore, varying levels of proactive road abandonment will be used on the Forest, ranging from full closure to installing water breaks by hand. It is also possible that some historically abandoned roads will not require any further treatment.

Prioritization of Forest roads for abandonment projects will come from the road inventory, which will be completed over the first three years of the Road Management Plan. The actual number of miles of existing road that will be proactively abandoned will depend on the results of the inventory, but it is estimated to be between 50 and 100 miles. Some of the criteria that will be used to identify roads to proactively abandon include: 1) unstable inner gorge areas, 2) roads in close proximity to a watercourse, 3) roads not needed for management purposes, and 4) roads with excessive amounts of perched fill. For further discussion on this topic, see Weaver and Hagans (1990, 1994).

Principles of the Proactive Road Abandonment Program

- Proactive road abandonment means actively treating a road to reduce erosion potential, so it will not contribute significant amounts of sediment to the stream system, even in severe storms, and will not need long-term maintenance. Future vehicular use of these roads is not intended after closure.
- Proactive abandonment will include removing culverts and reestablishing channels to their approximate original grade and channel configuration. The road prism at crossings will be pulled back to a stable slope configuration. Where necessary, the regraded channel will be armored to prevent downcutting or erosion of the old fill material.

- Potentially unstable fills will be pulled back and graded to a stable configuration, mulched, and seeded.
- Where possible, drainage facilities on temporary roads will be installed with features that will be self-maintaining, such as rolling dips, cross ditches with packed inside ditchlines, or outsloping. Waterbars will only be used where road grade or local topography prevents the installation of rolling dips. Temporary roads are intended to be re-opened for future use. Landings will be outsloped and drained with appropriate drainage facilities.
- Following completion of the road inventory (see section 1), a schedule will be developed for closure of temporary and improperly abandoned roads. This will not preclude abandonment work from being conducted prior to the completion of the inventory. For example, some roads in the Parlin Creek, Hare Creek, and Caspar Creek planning watersheds have already been proactively abandoned.
- Seasonal roads will be blocked during the wet season by locked gates. Access to temporary and proactively abandoned roads will be effectively blocked with physical obstacles.

Schedule for Road Network Improvement Activities

The goal is to complete the entire road and crossing inventory will be finished within three years, including data entry and report preparation. This will require surveying approximately 120 miles of road per year. A JDSF forester will directly oversee any contractors hired for this work.

The location of critical habitat for steelhead and coho salmon will be used to prioritize the sequence of the road inventory work. Secondary factors will include existing rates of sediment delivery to sensitive watercourse channels, based on gradient and degree of confinement, and likely hazards such as high density of riparian roads or stream crossings.

The focus of JDSF's road management program will be to minimize the volume of sediment that enters watercourses, rather than to maximize the number of miles of road treated per year. The amount of sediment delivery prevented, not the mileage of treated roads, is the appropriate scale to measure the accomplishments of this Road Management Plan.

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VI Recreation Data

A. Existing Recreation Facilities

1. Campgrounds

West-end: Roundhouse, South Fork 1, 2, and 3, Red Tail, Southbend, Wagon, Tilley, Trillium, Tin Can, Teacher's, Poison Oak, Camp 4, Camp 6, and Camp 8, Bob Woods, Volcano

The Camp Host site at Camp One has two trailer pads, a 350-gallon septic tank potable water tank and a phone line.

East-end: Dunlap, Horse Camp, Indian Springs and Big River

The Camp Host site at Dunlap has a potable water tank and a phone line.

Group campsite: Tilley

All developed sites have an outhouse, picnic table, trash can, and barbecue or fire ring. No potable water is available. Some of the campgrounds have outhouses and picnic tables that are accessible to the disabled.

2. Day-use only: Camp One, Camp 20, Dogwood

Camp One

This day-use area is accessed on the west-end of the Forest via Highway 20 at post-mile 5.9 onto Forest Road 350 and is located along the South Fork Noyo River. An interpretive display explains the Department of Fish & Game's Egg Collection Station at this location. The day-use area is suitable for large group gatherings, as there is a large parking area and numerous picnic tables with one that is covered and approximately 15' in length.

Camp 20

This area is located adjacent to Highway 20 at post-mile 17 on the east-end of the Forest along the North Fork of Big River. A steam donkey and interpretive displays are located here as well as a ball field, horseshoe pits, public restrooms and picnic tables. The area is approximately 3 acres with a large parking area.

Dogwood

Dogwood is located along Highway 20 at post-mile 18.6 along the North Fork of Big River. There is one picnic table overlooking the river at this location.

3. Hiking Trails

Camp One Loop Trail

This trail has a one-mile and a three-mile loop that traverse through an area that was harvested by helicopter in the mid-1990's with an initial group selection entry. The trailhead is located across the road from the Camp One day-use area. The trail can also be accessed off Forest Road 90 which intersects Highway 20 at post-mile 8.0. The trail traverses Road 90 for approximately ¼ of its total length.

Trestle Trail

This trail is approximately 4 miles in length and follows one of the old logging railroads along the North Fork of the South Fork Noyo River. Numerous trestles can be found along the trail as well as a small waterfall. The trail can be accessed off of Forest Road 361 (approximately 500' from Camp 8) or from Road 1070 (1.9 miles from Road 330). A long loop can be made by continuing up road 1070 from the upper end of the trail, onto Road 330 and down the Woods Trail back to Camp 8.

Waterfall Grove Trail

This is probably JDSF's most popular trail. The trail descends from Forest Road 200 approximately 0.2 miles into an old-growth grove adjacent to the west fork of Chamberlain Creek. The Forest's most scenic waterfall is located here. Access is off of Forest Road 200, 4.5 miles from Highway 20. Another access point can be found further along Road 200 at the intersection of Roads 200 and 1000, where the little used Camellia Trail follows a longer but gentler grade to reach the grove.

Little Lake-Sherwood Road Trail

This trail connects Little Lake Road in Mendocino (County Road 408) to Sherwood Road east of Fort Bragg by following a series of logging roads which traverse through JDSF. It is accessible for hiking, equestrians, and mountain biking for most of its length and provides users a look at the many aspects of a working forest. The trail is difficult to follow with trail markers varying from road numbers and directional arrows to signs on steel posts. This trail was established by the County of Mendocino and is not maintained by CDF.

Woods Trail

The Woods trail crosses an open meadow just south of Camp 8 on its way to Road 330 and Three Chop Ridge. The trailhead is marked with a wooden sign on Forest Road 361. The area had its first selection harvest entry in 1999 and 2000, and the trail has been partially re-routed.

B. Policies on Overnight Use:

1. Campfire Permits

The main purpose of requiring campfire permits is to ensure campfires are in compliance with firesafe regulations. In addition, recreation use information is collected from the permit (i.e. where visitor is from and length and location of stay).

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Permits are issued by camp hosts and are required of all overnight campers regardless of intent to make a campfire. The Camp Host should write a permit for a large group utilizing a day-use area without a reservation to keep track of visitor-use.

2. Reservation Policy

Pursuant to Title 14 CCR 1404, no individual campsites can be reserved. In the interest of protecting the resource, a group site may be reserved. The Forest Manager or designee must receive the reservation request two weeks in advance. The Forest staff must receive confirmation during the week of the event. Large groups utilizing day-use areas may reserve the site, but may be required to provide proof of payment for pumping the vault toilet at the reserved location.

An organized group event must obtain a special use permit from the Forest Manager which includes (at a minimum): (1) proof of insurance for the sponsoring group, naming the event and dates of operation, and naming the State of California as additionally insured for an amount to be specified for damages and liability; and (2) other conditions such as hours of the event, cleanup criteria, extra outhouses, maps, boundaries of operation, route marking, and an emergency evacuation plan.

3. Occupancy Limits

A general guideline is no more than 2 families and 2 vehicles per small campsite. Time limits are governed by Title 14 CCR 1403 which states campers are limited to 14 consecutive days and no more than 30 days per calendar year on any one State Forest. JDSF policy enforces the requirement for a minimum two-day absence between 14-day periods.

C. Carrying Capacity

1. Campgrounds

There are 21 campgrounds with a total of 65 individual campsites. Of these, 17 are open year-round (365 days) and the remaining 48 are open, on average, April 15 through October 15 (184 days). Capacity at each site is assumed to be eight people (two four-person families). The maximum physical carrying capacity, with every site occupied by eight people every night that it is open, is calculated as:

8 x 17 x 365 =	49,640
8 x 48 x 184 =	<u>70,656</u>
Total physical carrying capacity, campgrounds =	120,296 camper-days

2. Picnic areas

The three day-use picnic areas have picnic table seating for about 124 people. All picnic areas are open year-round:

$$\text{Total physical carrying capacity, picnic areas} = 124 \times 365 = 45,260 \text{ picnic-days}$$

3. Hiking trails

There are about 16 miles of recreational and interpretive hiking trails managed, maintained and sanctioned by the State Forest. (There are other trails of unknown total length that have

been developed by users without participation by the Forest. They are not included in the determination of carrying capacity.) Since hikers move along trails and do not occupy single points as with campgrounds and picnic areas, capacity is a little more difficult to determine. It is not reasonable to calculate full occupancy by counting the number of people that could stand shoulder-to-shoulder along the 16 miles of trail. Instead, this assessment assumes that a trail is fully occupied when hiking parties averaging four people each are spaced along the trail at 1/4-mile intervals. Since trails can be occupied more than once each day, maximum use is figured at double occupancy:

$$\text{Total physical carrying capacity, trails} = 4 \times 16 / .25 \times 2 \times 365 = 186,880 \text{ hiker-days}$$

4. Sustainable carrying capacities

The California Region of the US Forest Service uses 40% of maximum physical capacity to determine the recreation use level at which demand begins to exceed supply. This figure of 40% is used as a reference point in establishing the current sustainable carrying capacities for the three recreation categories.

- ◇ Campgrounds and picnic areas: Campground use at 40% of the calculated maximum physical carrying capacity would be over 48,000 camper-days, or three times the current average annual use. Counts of picnic area users are not available, but the relative numbers are probably similar. The camping and picnic facilities themselves could likely sustain a doubling of their current use, possibly more, without significant physical or environmental deterioration and without severely diminishing the quality of the recreation experience of the users. However, the personnel and fiscal resources of the State Forest would not be able to adequately manage the increased numbers of visitors, maintain the safety and cleanliness of the facilities, nor protect the Forest from abuse and the users from each other. For instance, the costs of additional garbage disposal and outhouse servicing could not be met by the current operating budget for the recreation program. However, some lesser increase over current use levels could be accommodated. It is estimated that the sustainable carrying capacities for campgrounds and picnic areas are 20% of the maximum physical capacities (which would be a 50% increase over the current level of use):

$$\text{Sustainable carrying capacity, campgrounds} = 24,059 \text{ camper-days}$$

$$\text{Sustainable carrying capacity, picnic areas} = 9,052 \text{ picnic-days}$$

- ◇ Trails: The most limiting factor affecting sustainable capacity of most hiking trails is parking space at trail heads. Because of the driving distance to the trail heads for the two longest trails, this calculation assumes that these two parking areas will be occupied only once each day. Using the more limiting of either physical trail capacity or parking capacity for each trail, the sustainable carrying capacity for hiking trails is determined to be:

$$\text{Sustainable carrying capacity, trails} = 81,030 \text{ hiker-days}$$

(This figure of 81,030 is 43% of the physical maximum, quite close to the 40% used by the US Forest Service.)

5. Carrying capacities with additional facility development

This management plan proposes to focus any new formal recreational development within a recreation corridor, to be centered around the existing core areas of Camp One and Camp

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20. For the purpose only of estimating potential future carrying capacities, a feasible, interim recreation corridor is described as:

- a) along the flats next to the South Fork Noyo River, from Road 332 downstream to the Forest boundary;
 - b) along the flats next to the North Fork South Fork Noyo River, from its mouth upstream to the end of Road 361; and
 - c) along the flats next to the North Fork Big River from near James Creek downstream to the Forest boundary.
- ◇ Campgrounds: In keeping with the rustic, informal character of State Forest campgrounds, it is estimated that campground capacity could be increased by 25% within this interim recreation corridor without compromising the remote, isolated nature of the current camping experience:

Potential expanded carrying capacity, campgrounds = 30,074 camper-days

- ◇ Picnic areas: Similar to campgrounds, additional picnic facilities could be developed to accommodate a 25% increase in use:

Potential expanded carrying capacity, picnic areas = 11,315 picnic-days

- ◇ Trails: Hiking trail expansion would likely involve trail heads generally located within the recreation corridor, with trail routes extending outwards into the rest of the Forest. One reason to build additional trails is to have alternatives to current popular trails when they are temporarily closed because of timber harvesting or other management activities. Another way that the trail system might be expanded is to incorporate some of the unofficial community trails that have been developed and used by neighbors along the western boundary of the Forest. Carrying capacity could also be increased by expanding parking areas at some trail heads. A doubling of the current value would be a reasonable estimate of potential future carrying capacity:

Potential expanded carrying capacity, trails = 162,060 hiker-days

Specific documents in JDSF library that can be referenced for more information:

JDSF Management Plan, 1983, CDF, Fort Bragg.

JDSF Recreation Use Needs Study, August 1988, Community Development by Design, Berkeley, DRAFT.

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Recreation Management Plan for the JDSF, March 1997, Albin-Smith, Fort Bragg, DRAFT.

Current Recreation Map (2006)

JDSF Annual Reports

VII Public Use Activities Other Than Recreation

Firewood

Camping

Only the campfire permit is required for collecting firewood for use while camping on the State Forest. Dead and down wood may be gathered for use while camping in any approved location .

Personal

Dead and down wood is made available to the public for personal use firewood in designated locations. Designated firewood-cutting areas normally become available subsequent to a completed Work Completion Report following a timber sale. Personal use permits for 2-4 cords for a given calendar year may be purchased at JDSF headquarters. Specific rules and fire-safe regulations are included with the permit as well as a map identifying which areas are open for noncommercial firewood cutting.

Commercial

Specific areas are designated only for commercial operators (i.e. must have a Timber Operator's License). Areas selected for commercial operations may be associated with a completed timber sale to facilitate fire hazard abatement, or may be located in an area where hardwood (tanoak or eucalyptus) removal is desired to enhance conifer growth. Only tanoak and eucalyptus can be felled in cases where live hardwood trees have been identified for removal.

A maximum of 10 cords may be purchased with each permit. The permit is valid for a 3-month period. No more than three commercial firewood operators are permitted access to a given designated area at one time to enable effective administration of the commercial operations. Thus, permits are available for commercial woodcutters on a rotating basis.

Mushrooms

Personal

Any person harvesting mushrooms on the State Forest must obtain a free mushroom gathering permit. The permit is valid for one calendar year and allows the permittee to harvest a maximum of one gallon per visit. Special permission must be obtained from the State Forest manager if more than one gallon is desired.

Commercial

Commercial permits may be purchased from the State Forest. Regulations, including limitations on the method of harvest, are incorporated in the permit.

Split Products/Poles/Salvage

The Forest Manager or designee responds to all individual requests for "other wood products". Prices are set using the Board of Equalization rates or other sources. At a minimum, the permit must include the following information: price agreed upon, location and date of harvest, estimated quantity and the Forest Manager's and permittee's signature.

Miscellaneous

Written permission from the State Forest Manager is required to gather any product from the State Forest.

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<http://www.rsl.psw.fed.us/projects/water/caspubs.html>

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<u>Date</u>	<u>Title</u>	<u>Author</u>
1/61	Seasonal Diameter Growth in Trees on Jackson State Forest	Richard Bawcom, Robert J. Hubbell, David Burns
2/61	A Test of Variable Plot Cruising in Young-Growth Redwood	Robert J. Malain
8/63	A Monterey Pine Planting - Frazier Planation	J. E. Sindel
8/63	Sugar Pine Planting on Jackson State Forest	R. J. Malain, D. M. Burns, J. E. Sindel
4/66	Redwood Sprouts on Jackson State Forest	Brian R. Barrette
2/68	Shade but not Top Pruning Improves Survival of Planted 1-0 Monterey Pine	R. S. Adams, Samuel T. Gossard, J. R. Ritchey
9/70	Board Foot by the Pound	David M. Burns
8/71	Grass & Fertilizer Selection for Road Spoil Erosion Control on Jackson State Forest	N. Stoneman
3/72	Use of Annual Ryegrass and Urea for Post Logging Erosion Control on Jackson State Forest	R. Jackman, N. Stoneman
12/74	Jackson State Forest - Caspar Orchard Eucalyptus Grove History and Volume Tables	Brian R. Barrette Ray Jackman
4/75	Black Stain Root Disease in Douglas-fir on Jackson State Forest	Ray Jackman Richard Hunt
4/76	"Mini-Yarder" Clears Streams on Jackson State Forest	Forest B. Tilley
11/76	Timber Sale Appraisals for Jackson State Forest	Gary F. Ross
7/77	Caspar Creek Watershed Study - A Current Status Report	F. B. Tilley
1/79	Rolling Dips	Bill Draper

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<u>Date</u>	<u>Title</u>	<u>Author</u>
5/80	An Evaluation of the FMC Tracked-Skidder on Jackson State Forest	Delmer L. Albright
10/82	Effects of Thinning on Redwood Sprout Growth	Dana W. Cole
5/83	Skid Trail Preconstruction: A Case Study of Logging Impacts and Productivity	Dana W. Cole
10/83	Observations of a Thirty-one-Year-Old Radiata Pine (<u>Pinus Radiata</u> D. Don) Planation in Northern California (Frazier Planation - Jackson Demonstration State Forest	Roy A. Woodward, Joseph Ontiveros
1/84	Waterbars - Making Them More Effective	Carlton S. Yee, Thomas Blakemore
3/84	The Evaluation of Formula and Decimal C Scribners; Are Conversion Factors Necessary to Provide Accurate Mill Scale Volumes from Forest Stand Cruises	Craig E. Anthony
9/84	Logging Residue Resulting from an Intermediate Harvest of a Second Growth Redwood Stand	Roy A. Woodward, Norman D. Henry
6/85	Caspar Creek Watershed Study - North Fork Phase, Jackson Demonstration State Forest Status and Plans 1983-1990	Norm Henry, Karen Sendek
6/86	Railroad Gulch: A Silvicultural Demonstration of Uneven-Aged Management Alternatives - A Progress Report	Dana W. Cole, John A. Helms
6/88	The Caspar Cutting Trails A Case Study Report 25 Years After Harvest	James L. Lindquist
9/89	Hare Creek Sprout Stocking Study on Jackson Demonstration State Forest	James L. Lindquist
1/91	Impacts of Ground-Based Log Skidding on Forest Soils in Western Mendocino County	Peter H. Cafferata, Thomas W. Sutfin
1/91	A Comparison of Techniques to Control Sprouting Hardwoods on Harsh Sites in Western Mendocino County	Peter H. Cafferata, Fay A. Yee

IX Guide to Determining the Need for Input From a Licensed Geologist During THP Preparation

CALIFORNIA LICENSED FORESTERS ASSOCIATION

August, 1999

Registered Professional Foresters (RPF) should address the following questions during Timber Harvesting Plan (THP) preparation. RPFs are encouraged to review California Division of Mines and Geology Note 50, *Factors Affecting Landslides in Forested Terrain*.

Are there unstable areas located within or adjacent to the proposed THP area?

- Were unstable areas identified on available geologic, landslide, and watershed maps, aerial photos, or previous THPs in the vicinity of the plan area?
- Were unstable areas observed in the field? Features associated with unstable areas may include:
 - Hillslopes greater than 65%, including inner gorge areas
 - Loose, unconsolidated soils
 - U-shaped swales
 - Irregular topography
 - Scarp
 - Benches
 - Hummocky ground
 - Surface cracks
 - Vegetative indicators
 - Leaning trees
 - Hydrophytes
 - Isolated patches of homogeneous vegetation
 - Disorganized drainage
 - Sag ponds
 - Seeps
 - Diverted watercourse
 - Road cut-bank failure
 - Road or landing fill failure

If unstable areas were identified in the THP area, proposed timber operations on, adjacent to, upslope, or downslope of these features may have the potential to affect slope stability through:

- Displacement of soil,
 - Division or concentration of drainage,
 - Reduction in interception or transpiration, and/or
 - Reduction in root strength.
- Examples of timber operations that may produce these effects are:
- Timber cutting
 - Construction and maintenance of:
 - Roads
 - Stream Crossings
 - Skid trails
 - Beds for felling of trees (layouts)
 - Fire breaks
 - Mechanical site preparation

- Prescribed burning

If proposed timber operations have a reasonable potential to affect slope stability, and there is a potential for materials from landslides or unstable areas to affect public safety, water quality, fish habitat or other environmental resources, then a California licensed geologist with experience/expertise in slope stability should be consulted to assess slope stability and assist with designing mitigation measures.

X MITIGATION and MANAGEMENT MEASURES

All pertinent mitigation and management measures are to be implemented as appropriate for all the affected resource areas listed below. Some of these have been previously identified in the document text and others are only listed here for reference when considering project implementation. This section is organized in similar format to Chapter 3.

Structure Conditions for Older or Late Seral Related Special Concern Areas

Areas identified to link old growth groves and provide habitat for wildlife species that prefer contiguous similar habitat containing large trees in the overstory are described in detail in Chapter 3. The spatial allocation is represented in Figure 5. Specific management measures for these areas are described below:

Late Seral Development Areas

Within the Late Seral Development Areas the objective of management will be to develop older forest through a variety of means, from relatively passive to active management. The more active forms of management will be conducted to accelerate the development of late seral structure. Late seral structure targets will include a significant component of large, old trees (greater than 150 years), as well as large snags, large down logs, deformed trees, multiple canopy layers, and a high degree of within-stand variability.

The Late Seral Development areas will receive the same special silvicultural management zone buffers as the old-growth grove reserves when THPs are adjacent. No even-aged silvicultural systems may be used within 300 feet, and only single tree/cluster selection or thinning may be used within the first 100 feet adjacent to these areas.

The Mendocino Woodlands Special Treatment Area (excluding the Railroad Gulch Research Area) will be managed as a Late Seral Development Area. Management for late seral attributes in this area may include thinning from below and individual tree selection designed to emphasize development and retention of large trees.

The Russian Gulch and Lower Big River Marbled Murrelet Habitat Recruitment / Late Seral Development Area. A study to demonstrate and assess the accelerated development of late seral habitat will be considered for this area. Possible management options include selective timber harvesting and/or prescribed fire to accelerate the natural stand selection process and to accelerate creation of large old trees and other functional habitat elements (i.e., snags, logs, cavities, dead tops). The State Forest will consult with wildlife management agencies, the California Department of Parks and Recreation, the California Department of Fish and Game, and other interested parties before proceeding with any related project.

Watercourse and Lake Protection Zones (WLPZ) on Class I and Class II streams will be managed for the development and maintenance of late seral forest characteristics.

Older Forest Structure Zone and Corridor

An older forest structure zone (OFSZ) has been designated to provide for an extensive corridor of older forest structure across the Forest (see Figures 5 and 6). The OFSZ corridor connects most of the old-growth groves and late seral development areas on the Forest.

This area will be passively and actively managed to create functional habitat consisting of large trees, snags, down logs, to maintain a high degree of structural diversity. In some areas, often as part of research projects, active management may be conducted for both production purposes and to accelerate the creation of this habitat. Once large tree targets and other structural targets

are met, timber harvest will be designed to ensure the retention, replacement, and recruitment of stand elements. Large and old growth trees of structural value will be retained and some individual large trees will be recruited so that all stands within the OFSZ will eventually have the key elements of older forests – large trees, old trees, large snags, down logs, and a diversity of tree sizes and canopy heights.

Forest Management

Uneven-aged Management

Where timber harvest is proposed near old-growth groves or late seral development areas, a buffer will be applied (see above).

Even-aged Management

Clearcutting, which regenerates one-aged stands, will be restricted to a cumulative maximum of 100 acres (or 0.2 % of Forest area) per decade and only for purposes of research, demonstration, or addressing problematic conditions for regeneration. Up to an additional 400 acres may be clearcut per decade, but only for research purposes that cannot be met through any other method.

Where timber harvest is proposed near old-growth groves or late seral development areas, a buffer will be applied. No even-aged silvicultural systems may be used within 300 feet.

Also see Recreation and Aesthetics, Aesthetics, Mitigation 1

Special Concern Areas and Unique Habitat

Special concern areas will be detailed below or will be included under the resource area tied to their objective elsewhere in the Appendix. This section is intended to provide a cross-reference.

Not Listed in Other Sections

Pygmy Forest

JDSF will maintain the current distribution and species composition of this plant community and protect it from harmful human disturbance, while continuing to allow compatible recreational activities. Sphagnum Bogs will be protected due to their location within the Pygmy forest and their wetland status.

Cypress Groups

Cypress Groups, elements of bishop pine/pygmy cypress forest on unproductive soils (non-timberland), will not be subject to harvest. Note that both of these species can occur in redwood forest. In these areas (i.e. timberland) harvest may occur. As a special status plant species, effects to individual upland pygmy cypress will be evaluated on a project basis.

Mushroom Corners

Additional Botanical Management Measure 2

Harvests: The area is available for future study related to the relationship between fungi and the forested habitat. Most of the future harvests in this area will utilize various forms of uneven-aged management, including single tree and small group selection. Consultation will be initiated with representatives of the mycological research community while planning for future harvest activities.

Fire, Fuels Reduction or other Active Management: Consultation will be initiated with representatives of the mycological research community during planning of any management-related fire or fuels reduction activities.

Invasive Plant Management: Invasive plant control will have a high to moderate priority in this area to insure continued presence of native species that interact with the fungi in the area.

Monitoring:

Timing:	During the life of the JDSF Management Plan
Scope:	Mushroom Corners
Implementation:	CDF
Monitoring Responsibility:	CDF

Parlin Fork Management Area

This area is used as a demonstration area for small woodland management. It will continue to be managed using a group selection strategy as described in the 1992 Parlin Fork plan. State Forest staff will provide technical assistance and advice to the CDF Assistant Chief at Parlin Fork in environmental assessment and protection, harvest planning, reforestation, stocking control, burning, and other management activities

Jughandle Reserve

An administrative area designated to protect a tract of pygmy forest within JDSF and to manage recreational access to these lands in a manner compatible with human use in the adjacent Jughandle State Reserve.

Eucalyptus Infestation Area

This is an area of special management concern because of the need to control eucalyptus to allow regeneration of conifers in this stand and to prevent the spread of this exotic species on the Forest. JDSF intends to convert this area to native conifer species.

Research Areas

In research areas, a dedicated timber harvest or other project may be designed specifically to fulfill the objective of that area.

High Relative Landslide Potential Areas

Areas identified as having a high relative landslide potential using the best available information. These areas will be reviewed on the ground following the guidelines presented at the 1999 CLFA workshop. They are potentially subject to limitations on road construction, yarding methods, and silviculture and may need to be evaluated by a CEG. See also Geology and Soils section.

Inner Gorges

Inner gorge and unstable areas will be identified during initial THP preparation. A Certified Engineering Geologist (CEG) will be consulted for appropriate measures needed to avoid or minimize impacts where timber harvesting is proposed within the inner gorge, and when appropriate for proposed timber harvesting and use of ground-based equipment within unstable areas. While potential inner gorge areas for JDSF have been mapped by the California Geologic Service (largely from aerial photographs), they will be field verified prior to logging. Road construction and ground-based yarding activities in inner gorges will not take place without CEG advice. See also Appendix V, Road Management Plan and Geology and Soils section below.

Domestic Water Supplies

Designated areas for domestic water supply in JDSF that are sensitive to disturbance. Only a limited range of silviculture is allowed in these areas.

Buffers adjacent to non-timberland neighbors

Areas along the boundary of JDSF adjacent to non-industrial timberland owners where a buffer zone is designated to minimize impacts on neighbors. Only a limited range of uneven-aged silviculture is allowed in these areas.

Power line right-of-way

Operated by PG&E. The power line right-of-way runs through the Forest, generally parallel to Highway 20. The maintained clearing is not available for timber production.

Listed in Structure Conditions for Older or Late Seral Related Special Concern Areas

Late Seral Development Areas

Older Forest Structure Zone

Woodlands Special Treatment Area - Also see Recreation

Listed in Aquatic, Wildlife and Plant Habitat section, with the subsection following:

Reserved old growth groves - Old Growth

Northern spotted owl nest areas - Specific Wildlife Species of Concern

Osprey nest areas - Specific Wildlife Species of Concern

Listed in the Recreation and Aesthetics section:

Conservation camps

Road and trail corridors

State Park Special Treatment Areas

Campground Buffers

Listed in the Riparian Zone, Aquatic Resources, Wetland, Water Quality, Large Woody Debris Section

Water/Lake Protection Zones - See also Timber Management: Post Timber Operations Monitoring, and Late Seral Recruitment Areas

Timber Management

See Forest Management for silvicultural limitations.

Post Timber Operations Monitoring *(also in December 2005 DEIR VII.6.1-95)*

Completed THPs that have over-wintered for 1 to 4 years will be monitored. The scope of this THP monitoring in relation to minimizing erosion impacts will include:

- inspection of all watercourse crossings, road segments and landings
- mapping the location of rilling/gullying on roads, landings, etc. that are contributing sediment to watercourses
- mapping the location of mass wasting features (including cutbank/fillslope failures) associated with roads, crossings, and landings, or within harvest units
- mapping the location of road drainage structures (including crossings) that are contributing significant amounts of sediment to watercourses
- measurement of WLPZ canopy for Class I watercourses
- recording information on the causes of erosion features, proposed improvements, and a schedule for mitigation treatments

Documented erosion problems will be analyzed to determine what management practice or site-specific condition was responsible. Adaptive management solutions will be site specific and based on professional judgment of JDSF staff.

Specific Management Programs

Road Management

The Road Management Plan includes six major components and should be referred to in its entirety (Appendix V). The standards and mitigations included in the Road Management Plan should be referenced in that document to understand the context of the direction.

For survey and planning regarding roads also refer to the Heritage Resources, Geology and Soils, Wildlife and Plant sections of this Appendix.

Heritage Resources

Mitigation Measure 1

Implement appropriate measures (project redesign and site avoidance, or mitigation such as data recovery or documentation of historic buildings in accordance with the Secretary of Interior's

Standards) to avoid, minimize or mitigate adverse impacts from timber harvesting on significant heritage resources that may be impacted by THP activities. THP reviews will regularly consider potential impacts to significant heritage resources located along regularly used or main logging access roads, assess the potential for long-term site attrition, consider the appropriateness of CARIDAP: Sparse Lithic Scatters (Jackson et al. 1988) and, for other types of sites, consider data recovery excavations, site capping, and/or road realignment and proper abandonment where feasible and appropriate. To do this, the appurtenant roads need to be mapped and included in the archaeological survey for the THP. Road survey coverage shall be plotted on the JDSF archaeological survey database maps.

Monitoring 1

Timing: During the life of the JDSF Management Plan
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF

Mitigation Measure 2

THP-specific studies performed in accordance with Forest Practice Rules shall include (a) oversight and review of Confidential Archaeological Addendums by qualified professional archaeologist for studies conducted by certified RPFs, (b) a current archaeological records check as defined in 14 CCR Section 895.1 that would include review of identified but unrecorded historic resources listed in Gary and Hines (1993), and (c) formal recordation to current standards of all identified heritage resources, among other standard procedures.

Monitoring 2

Timing: During the life of the JDSF Management Plan
Scope: Forest-wide
Implementation Responsibility: CDF
Monitoring Responsibility: CDF

Mitigation Measure 3

Conduct heritage resources training for all permanent forestry field staff at JDSF, and obtain and maintain current certification in identification of archaeological sites for key staff to assist with heritage resources surveys, site recordation, monitoring of mitigation measures and site conditions, handling inadvertent discoveries, and educating contractors and the public about heritage resource protection laws and JDSF's heritage resources.

Monitoring 3

Timing: Yearly, during the life of the JDSF Management Plan
Scope: Forest-wide
Implementation Responsibility: CDF
Monitoring Responsibility: CDF

Mitigation Measure 4

The JDSF Forest Manager or his/her designee will initiate consultation with local Native American tribes regarding Native American gathering areas or other locations of cultural or religious importance. Confirmed locations shall be plotted on the JDSF heritage resource database. This database will be reviewed prior to each THP, and specific management of these locations will be developed.

Monitoring 4

Timing: Annually during the life of the JDSF Management Plan
Scope: Forest-wide

Implementation Responsibility: CDF
Monitoring Responsibility: CDF

Mitigation Measure 5

In concert with the Pre-Suppression Plan to be developed for JDSF, employ appropriate procedures prescribed in *Archaeological Review Procedures for CDF Projects* (Foster 2003) to avoid potential impacts to significant heritage resources where pre-fire defense improvements (e.g., fire breaks, fuel reduction treatments, helispot locations, water tanks, adequate road and trail access) and incident camps would be established. Document heritage resources study findings using the CDF Archaeological Survey Report form or other report format consistent with OHP (1989) guidelines.

Monitoring 5

Timing: During planning and implementation of the Pre-Suppression Plan
Scope: Forest-wide
Implementation Responsibility: CDF
Monitoring Responsibility: CDF

Mitigation Measure 6

To the extent practical during emergency fire-fighting activities, rely on persons trained to identify archaeological sites (CDF Archaeologists, professional archaeologist-contractors and/or CDF staff with current archaeological training) to avoid or minimize heritage resource impacts from fire suppression and support activities (e.g., grading or hand-digging of fuel breaks, establishment of incident camps).

Monitoring 6

Timing: During the life of the JDSF Management Plan and Fire Protection/Management Plan
Scope: Forest-wide
Implementation Responsibility: CDF
Monitoring Responsibility: CDF

Mitigation Measure 7

After a wildfire has been suppressed, request a CDF Archaeologist to oversee and document site damage assessments and as needed, develop and supervise site stabilization, data recovery or rehabilitation efforts, with assistance, to the extent possible, from CDF staff possessing current archaeological training.

Monitoring 7

Timing: During the life of the JDSF Management Plan and Fire Protection/Management Plan
Scope: Forest-wide
Implementation Responsibility: CDF
Monitoring Responsibility: CDF

Mitigation Measure 8

To lessen the potential for significant impacts to heritage resources, CDF shall adhere to the procedures for the identification and protection of heritage resource established for prescribed burn projects located on private or state lands conducted under the Department's VMP program. These procedures are specified in *Archaeological Review Procedures for CDF Projects* (Foster

2003), which requires a Preliminary Study to determine if impacts to heritage resources are possible. If so determined, a heritage resource inventory will be required, including a records check, notification to Native Americans, prefield research, an on-the-ground field survey, development of protection measures, recording of sites, and the completion of an archaeological survey report meeting professional standards.⁴

Monitoring 8

Timing: During the life of the JDSF Management Plan and Fire Protection/Management Plan
Scope: Forest-wide
Implementation Responsibility: CDF
Monitoring Responsibility: CDF

Mitigation Measure 9

Potential adverse impacts to important Native American plant collecting areas from prescribed burns will be avoided by consulting with interested Tribes about potential effects of fire on plant collecting areas and modification of prescribed burn plans as necessary to avoid significant adverse effects.

Monitoring 9

Timing: During the life of the JDSF Management Plan and Fire Protection/Management Plan
Scope: Forest-wide
Implementation Responsibility: CDF

Mitigation Measure 10

Prior to the conduct of potentially damaging project activity and in consultation with CDF professional archaeologists, apply appropriate research and survey methods to identify heritage resources along roads that have potential to be impacted by regular road maintenance and use of existing rock borrow pits and enact protection measures (e.g., avoid grading, cover with imported soils or asphalt, monitor operations) to minimize or avoid impacts to significant sites. Document heritage resources study findings using the CDF Archaeological Report Form or other report format consistent with OHP (1989) guidelines. In concert with the present practice of avoiding impacts to known heritage resources from regular road maintenance, apply the standard steps prescribed in *Archaeological Review Procedures for CDF Projects* (Foster 2003) to avoid impacts to known heritage resources from maintenance of related road appurtenances (e.g., culverts, bridges) and existing borrows pits. Prior to any road grading work, the current database of heritage resources shall be checked to determine if any known sites exist along the road segments to be treated, and an archaeological survey of the road segments shall be conducted by either a professional archaeologist or permanent forestry field staff with current archaeological training. The results of road segment surveys will be added to the heritage resources database and referred to for determining which road segments can undergo periodic road maintenance

⁴ This survey work may be conducted by an archaeologically-trained CDF Forester rather than a professional archaeologist, however, in such cases, a CDF staff archaeologist reviews the work for elements of completeness, accuracy, content, and professional adequacy. The reviewer also makes specific recommendations to correct any deficiencies, and if necessary, conducts a field inspection to examine heritage resource discoveries, spot check areas to test adequacy of survey coverage, review site records in field settings, and make recommendations for follow-up work, if needed. Most importantly, this review includes a careful evaluation of the proposed protection measures to ensure that the project has been designed to be in conformance with applicable state laws and regulations.

activities without additional archaeological considerations and which segments need ongoing monitoring. Specific mitigation measures to record and/or protect the site(s) will be developed.

Monitoring 10

Timing: During the life of the JDSF Management Plan and Fire Protection/Management Plan
Scope: Forest-wide
Implementation Responsibility: CDF

Mitigation Measure 11

For new road construction or substantial improvements to existing roads and appurtenances (including development of new rock borrow pits), apply standard procedures described in *Archaeological Review Procedures for CDF Projects* (Foster 2003) to avoid potential impacts to significant heritage resources. Consider relocation of new roads as needed to avoid potential impacts to significant heritage resources. Where known site boundaries are not systematically defined or in question, establish reasonable buffer zones for heritage resources where ground disturbing maintenance activities will be avoided, and monitor for compliance. Document heritage resources study findings using the CDF Archaeological Survey Report form or other report format consistent with OHP (1989) guidelines.

Monitoring 11.

Timing: During the life of the JDSF Management Plan; in conjunction with implementation of JDSF Road Management Plan
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF

Mitigation Measure 12

When planning for decommissioning of roads and/or related appurtenances, employ standard procedures described in *Archaeological Review Procedures for CDF Projects* (Foster 2003) to avoid potential impacts to significant heritage resources. Consult with interested Tribes whose aboriginal territories included all or part of JDSF to determine if significant traditional cultural properties or other heritage resources such as plant collecting areas are present and may be affected. Where impact avoidance is not feasible, consult with a CDF archaeologist to develop and implement alternative mitigation measures. Document heritage resources study findings using the CDF Archaeological Survey form or other report format consistent with OHP (1989) guidelines.

Monitoring 12

Timing: During the life of the JDSF Management Plan; in conjunction with implementation of JDSF Road Management Plan
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF, SHPO

Mitigation Measure 13

Before substantial ground disturbing maintenance or planned improvements are carried out (DFMP Section 3, Recreation, Aesthetics, and Public Use), an archaeological survey shall be performed by a CDF staff archaeologist or a person with current CDF archaeological training. The survey shall follow the procedures outlined in *Archaeological Review Procedures for CDF Projects* (Foster 2003). Document heritage resources study findings in a format adapted from CDF's Archaeological Survey Form or other report format consistent with OHP (1989) guidelines.

Monitoring 13

Timing: During the life of the JDSF Management Plan
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF

Mitigation Measure 14

Identify known heritage resources in existing campgrounds, other high-use visitor areas (e.g., Camp 20), and in area of other administrative facilities that are being impacted by regular maintenance activities, and enact protection measures to minimize or avoid impacts to significant sites. Document heritage resources study findings using the CDF Archaeological Survey Form or other report format consistent with OHP (1989) guidelines. Planning for regular maintenance of, development of new, improvements to and abandonment of facilities needs to consider and implement measures to avoid or minimize potential impacts to significant heritage resources. Document heritage resources study findings in a format adapted from CDF's Archaeological Survey Report form or other report format consistent with OHP (1989) guidelines.

Monitoring 14

Timing: Implement appropriate protection or treatment measures after heritage resources are inventoried and/or prior to carrying out activities
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF, SHPO

Mitigation Measure 15

Develop new trails, recreational and visitor facilities to minimize potential for vandalism. Educate contractors and visitors about the proper procedures for protecting any artifacts that they may find on JDSF.

Monitoring 15

Timing: During life of the JDSF Management Plan
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF

Mitigation Measure 16

Revise the more widely distributed JDSF visitor brochures to include an advisory statement that the unauthorized collecting of artifacts and the looting or vandalism of sites is prohibited by State law, and provide direction on what the visitor should do in the event that prehistoric or historic artifacts are encountered on the Forest.

Monitoring 16

Timing: Completion within the life of the JDSF Management Plan
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF

Mitigation Measure 17

Consult with interested Tribes to identify important traditional plant collecting areas. Minimize or avoid pesticide use in traditional collection areas where such action will reduce adverse impact on plant resources traditionally utilized by Native Americans. Develop a Native American gathering permit policy where such gathering can be permitted by the Forest Manager, and take steps to ensure that gathering does not take place in any areas that may have been treated with herbicides.

Monitoring 17

Timing: During life of the JDSF Management Plan; in conjunction with development and implementation of subsequent planning documents
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF

Mitigation Measure 18

When planning for or reviewing proposed demonstration and research projects that have the potential to disturb significant heritage resources, employ standard procedures described in *Archaeological Review Procedures for CDF Projects* (Foster 2003), and in the *Forest Practice Rules for the Protection of Archaeological and Historical, and Cultural Sites* (CDF 2003), and include a check of the current JDSF heritage resource database to include review of historic period sites identified by Gary and Hines (1992) to avoid potential impacts to significant heritage resources. Document heritage resources study findings in the CDF archaeological Report form, or other report format consistent with OHP (1989) guidelines.

Monitoring 18

Timing: During life of the JDSF Management Plan
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF

Invasive Weeds

Staff will consider the impacts of invasive weeds to native vegetation during the normal course of project development. If there is a reasonable likelihood of weed spread due to a nearby infestation, mitigation will be considered where appropriate and consistent with IWM to minimize the spread of invasive weeds. Conservation and reestablishment of native vegetation will be considered in disturbed open areas adjacent to forest roads in order to minimize weed spread.

A staff training program in identification of invasive weeds will be implemented. Training topics will include: integrated weed management, the ecological and management impacts of weeds, a weed location reporting system, and the employee's role in weed management.

Weed infestations on the State Forest will be periodically evaluated. Evaluation will include the following factors: weed species, location, probable causes of infestation, control treatments considered or applied, and the effectiveness of the treatments.

JDSF will cooperate with local, state and federal agencies, forest landowners, private organizations (and public organizations to work towards control of invasive exotic weeds).

State Forest Staff will make an effort to identify post-harvest emerging weed populations during periodic examinations of harvest units and forest roads coincident with erosion control and forest stocking inspections. Treatment decisions will be made within the context of IWM goals.

JDSF, as one of the project initiators, will continue to support the International Broom Initiative to investigate biological control agents for French broom, Scotch broom, Spanish broom, Portuguese broom, and Gorse.

Staff will increase their knowledge base of invasive weed species currently infesting, or potentially infesting the Forest.

Staff will utilize current information pertinent to each specific weed management issue prior to selecting and implementing control methods. To the extent feasible, avoid or minimize the use of chemical (herbicides) weed management tools.

Herbicides

JDSF staff will adopt the following limitations to potential herbicide use:

Seek opportunities to demonstrate a range of vegetation treatments so that local information is available on vegetation treatment options.

No herbicide will be used unless it is integral to long-term, ecological based management. Projects will be proactive rather than reactive. Long-term management will often integrate a variety of treatment techniques.

Public and environmental safety is a priority. When herbicide use is indicated, JDSF staff will reduce risk by selecting appropriate herbicide formulations and application techniques.

Herbicide use will be evaluated for aesthetic effects where forest visitors could have negative aesthetic reaction to treatments.

Herbicides will not be used for roadside vegetation clearance to treat native vegetation, unless there are significant over-riding management concerns specific to the area, such as fire prevention.

Riparian Zone, Aquatic Resources, Wetland, Water Quality, Large Woody Debris

Aquatic Resources *(also found in December 2005 DEIR Page VII.6.1-48)*

To prevent any future impacts to water temperature from the proposed management plan, JDSF will meet or exceed all watercourse protection measures as stated in the FPRs. In addition, JDSF is committed to maintaining a network of monitoring stations that can be used to document trends in water temperature and identify potential impacts on water temperature from forest management.

Floodplain Management Measures

Where there is evidence of floodplain connectivity for storm events with return intervals of 20 years or less in areas that are proposed for timber management, Forest staff will be utilize the guidelines stated in "Flood Prone Area Considerations in the Coast Redwood Zone (November 2005). In addition, Forest staff will be guided by the evaluation procedures included in the Riparian Protection Committee's Final Report.

Water Quality

Beneficial uses of water will be protected by compliance with water quality objectives in accordance with the Water Quality Control Plan for the North Coast Region (Basin Plan), and by implementing required TMDL measures.

Comply with other relevant laws of the North Coast Regional Water Quality Control Board, including the Anti-degradation Policy, TMDL Implementation Policy statement, the Nonpoint Source Policy, and other relevant current regulations, as well as any additional relevant regulations that may be implemented over time.

Water/Lake Protection Zones- Habitat Protections *(also in December 2005 DEIR 6.1.12)*

JDSF will manage forested stands in WLPZs to promote their ecological succession to late-successional forest conditions. Except as modified to support research conducted under appropriate authorities, watercourse protection measures will include all applicable FPRs and will at all times meet or exceed the following levels:

- Class I–150 foot WLPZ; Class II–50 to 100 foot WLPZ. Zone widths are to be expanded where appropriate (e.g., unstable areas, etc.).
- Timber operations within channel migration zones will not occur (except as allowed in the Forest Practice Rules).
- Class I inner band–0 to 25 feet from the watercourse transition line: No-cut (except for harvest of cable corridor trees where needed) or limited entry to improve salmonid habitat through use of selection or commercial thinning silvicultural methods. At least 85 percent overstory canopy (where it exists prior to harvest) is to be retained within 75 feet of the channel.
- Class I outer band–remainder of WLPZ: High basal area and canopy retention zone. Vertical overstory canopy (measured with sighting tube) at least 70 percent (where it exists prior to harvest) is to be retained in the outer band.
- Within Class I and Class II WLPZ, retain a minimum of 240 sq. ft. conifer basal area following completion of timber operations.
- Reentry–No more frequently than every 20 years for Class I WLPZs.
- Class I/II: Ten largest conifers per 330 feet of stream channel retained within 50 feet of the watercourse transition line.
- Class II inner band–0 to 25 feet from the watercourse transition line: No-cut (except for harvest of cable corridor trees where needed) or limited entry to improve salmonid habitat through use of selection or commercial thinning silvicultural methods. At least 85 percent overstory canopy (where it exists prior to harvest) is to be retained within 25 feet of the channel.
- Class II outer band–remainder of WLPZ: High basal area and canopy retention zone. Overstory canopy will be retained to prevent water temperature increases and allow for adequate canopy recovery where required.
- Class III–ELZs will be at least 25 feet on side slopes less than 30 percent, and 50 feet on slopes greater than 30 percent. These zones will be expanded where site-specific investigations reveal that additional protection is merited.
- Class III–Burning will be conducted so that the majority of large woody debris is left within the ELZ. Fuels are not to be ignited within 50 feet of Class III channels.
- LWD within the WLPZ will be retained and recruited to the stream system unless it presents an imminent risk to drainage structures.

- Retain native hardwoods in the WLPZ except where species imbalance has occurred.
- Salvage of dead or dying trees will not occur within the WLPZ, old-growth augmentation area, species-specific management area described in a Habitat Conservation Strategy, or other area specifically identified. Exceptions may exist in response to large-scale occurrence of fire, insect attack, windthrow, or threat to infrastructure.

Springs, and Seeps

Natural springs and seeps that may provide habitat for non-fish aquatic species are provided the same protections as Class II streams.

Large Woody Debris Survey, Recruitment, and Placement

Large woody debris survey, recruitment, and placement management measures have been developed to contribute towards a more rapid recovery of aquatic habitat features and functions related to LWD.

I. The following apply to all THPs:

- A. Conduct either programmatic or THP-specific instream LWD surveys of Class I and II streams to determine LWD loading prior to designing final WLPZ prescriptions for a THP.
 - 1. If the surveys indicate that instream wood loads meet target criteria as described in Bilby and Ward (1989), then no further steps are needed and the standard DFMP measures apply.
 - 2. If the surveys indicate that instream wood loads do not meet target criteria as described in Bilby and Ward (1989), then implement either a or b:
 - a. Class I and Class II WLPZ silviculture will either be no-cut (except for harvest of cable corridor trees where needed) within 100 to 150 feet of the watercourse transition line for Class I or 75-100 feet for Class II, or limited to removal of codominant, intermediate, or suppressed trees to promote growth on the larger diameter dominant trees and improve LWD recruitment potential. Some flexibility should be maintained to allow removal of large trees to adjust species composition and improve the potential permanence of future LWD; however the goal of enhanced LWD recruitment must still be met.
 - b. Assess the potential for placing large wood into the Class I or Class II channel. Where assessment indicates that instream LWD placement is feasible, would have a clearly beneficial effect upon aquatic habitat, and is deemed appropriate by DFG, place unanchored log and/or rootwads in streams. Most of the placed LWD should exceed one bankfull width in length. Where assessments indicate instream LWD placement is not feasible, then measure A(2)(a) is to be applied.
- B. If LWD surveys per A are not conducted, WLPZ prescriptions default to A(2)(a), above.
- C. For specific research and demonstration purposes related to ecological questions (e.g., exploring the role of streamside canopy openings in increasing benthic productivity and fish response), A and B may be overridden on a limited basis.

II. Experiment with placement of LWD in Class III streams to improve sediment metering and other hydrologic functions.

JDSF will manage for a minimum of two downed logs per acre that are at least 20 feet in length with a diameter of 16 inches on the large end and one log per acre at least 24 inches in diameter on the large end and at least 20 feet long. Log densities are averaged over a 160-acre subwatershed area. WLPZs and special concern areas will contribute a greater proportion of downed logs.

Stream Channel Conditions *(also in December 2005 DEIR VII.6.1-95)*

Surveys of stream channel conditions will be implemented for a limited number of streams on JDSF. Monitor long-term trends in channel morphology, habitat quality and woody debris, and evaluate the effectiveness of prescriptions designed to maintain or improve aquatic and riparian habitat conditions and minimize sediment delivery to watercourses.

Parameters sampled will vary depending on the stream reach evaluated, but may include:

LWD frequency by size class, with information on condition and placement

Pool dimensions (including pool volume), residual pool depth, and useable rearing/holding/overwintering habitat)

Pool frequency

Gravel permeability, embeddedness and size distribution (including overall d50 of sampled reaches)

Channel dimensions (measured using transects)

Longitudinal profiles and cross sections

Bank conditions and entrenchment

Benthic macroinvertebrates

Watercourses Crossings

Refer to the mitigations/management measures for the following topics that are included in this Appendix (Heritage Resources, Fish, Wildlife, and Plants, and Watersheds as well as the mitigations included in the Road Management Plan (Appendix V Sections 2.to 5). The following are an example of mitigations found in those sections that are specific to roads located in or near watercourses:

1. Roads to be part of the permanent road network are to primarily utilize upper slope locations without ditchlines connected to watercourses where possible.
2. Roads located within watercourse and lake protection zones (WLPZs) are to be abandoned where other existing feasible routes are available. Where there are no feasible alternatives, use will be minimized.
3. Winter storm inspections are to be used in sample and high-risk areas to insure that road drainage structures are functioning properly.
4. Work is to continue to restrict public motorized vehicular access to vulnerable sections of the road network during the winter period, as well as to educate the public regarding the importance of wet-weather road closures.
5. Road segments near watercourses that are to remain in the permanent transportation network with inadequate road surfacing will be evaluated for potential surfacing with competent rock to reduce surface erosion.

6. Placement of road spoils within the WLPZ will be avoided.

Geology and Soils *(also in December 2005 DEIR Part VII.7-30)*

The following methodology will be utilized for the assessment of slope stability to be conducted during preparation of THPs and other management related activities:

Office Review of Existing Information

- CGS maps of landslide related features and relative landslide potential
- aerial photographs
- prior THPs and their geologic reports

Field Review

Once office review has been completed, an on-site evaluation will be conducted throughout the project area by an RPF. Areas highlighted during the office review of existing information will receive special attention. The RPF will follow the 1999 "California Licensed Foresters Association Guide to Determining the Need for Input From a Licensed Geologist During the THP Preparation." Refer to Appendix IX.

Certified Engineering Geologist Input

A Certified Engineering Geologist (CEG) is to be consulted as appropriate during the design phase of timber sale preparation work to address slope instability and erosion issues identified during office and field reviews. The 1999 California Licensed Foresters Association (CLFA) Guide to determining the need for input from a licensed geologist during THP preparation in Appendix IX will be used to aid in determining when to call for the services of a CEG.

Mitigation 1.

Use CGS-compiled landslide maps (Short and Spittler 2002a; Manson, Sowma-Bawcom, and Parker 2001; Manson and Bawcom 2004) and relative landslide potential maps [Short and Spittler 2002b; Manson, Sowma-Bawcom, and Parker 2001] to (a) identify areas of potential instability during THP preparation, road layout, and other construction activities, and (b) designate "shallow landslide potential areas" as Special Concern Areas.

Monitoring 1.

Timing: During the life of the JDSF Management Plan
Scope: Designation of shallow landslide potential Special Concern Areas throughout the Forest; THPs, road layout, and other construction projects.
Implementation: CDF
Monitoring Responsibility: CDF

Mitigation 2.

Use CGS-compiled landslide maps (Manson and Bawcom 2004; Manson, Sowma-Bawcom, and Parker 2001; Short and Spittler 2002a) and relative landslide potential maps (Manson, Sowma-Bawcom, and Parker 2001; Short and Spittler 2002b) to (a) identify areas of potential instability during THP preparation, road layout, and other construction activities, and (b) designate "shallow landslide potential areas" as Special Concern Areas.

Monitoring 2.

Timing: During the life of the JDSF Management Plan

Scope: Designation of shallow landslide potential Special Concern Areas throughout the Forest; THPs, road layout, and other construction projects.

Implementation: the Department

Monitoring Responsibility: the Department

Mineral Resources *(also in December 2005 DEIR Page VII.4-1)*

Any new rock pit or quarry would be subject to separate environmental review when specific information is known regarding size and location.

Fish, Wildlife and Plants including Habitat

Aquatic Organisms and Habitat

Protection measures for Aquatic organisms and habitat are included in the Riparian Zone, Aquatic Resources, Wetland, Water Quality, Large Woody Debris section and Appendix V (Road Management Plan).

Wildlife Habitat Elements including Old Growth

Snag Retention/Recruitment goal for the entire forest is to attain one snag per acre (on a 160-acre sub-watershed scale) that is at least 30 inches DBH. The desired future condition for snags in all wildlife special concern areas is to have three snags per acre, of which two are at least 20 inches DBH and one is at least 30 inches DBH, averaged over a 160-acre sub-watershed area. Periodic sampling will be utilized to monitor snag density, as part of the CFI inventory system.

The December 2005 DEIR included the following specific mitigation for snag and LWD dependent wildlife species:

Wildlife Mitigation 1

Retain all snags within all timber harvest areas with the exception of snags that pose a fire or safety hazard, or are within the alignment of roads proposed for construction. The largest snags, including residual old-growth snags, should have priority for protection until the snag retention goals of the DFMP are met.

Wildlife Monitoring 1

The DFMP establishes monitoring standards in-regard to the snag retention requirements. No changes to those standards are required.

Large Woody Debris on the Forest Floor

JDSF will manage for a minimum of two downed logs per acre that are at least 20 feet in length with a diameter of 16 inches on the large end and one log per acre at least 24 inches in diameter on the large end and at least 20 feet long. Log densities are averaged over a 160-acre subwatershed area. WLPZs and special concern areas will contribute a greater proportion of downed logs.

Hardwoods

JDSF will maintain the naturally occurring hardwood components in riparian stands (WLPZs) and other special concern areas when consistent with the objectives of that area. The goal is to maintain hardwood tree composition at approximately 10 percent (West End) to 15 percent (East End) of the stand basal area. Representative trees of large sizes will be retained or recruited, in

addition to trees with other structural values, such as basal hollows and cavities.

Old Growth

An old-growth conifer tree is any live conifer, regardless of size or species that was present in the original stand before the first historic logging on JDSF (1860), based upon the professional judgment of JDSF staff. Characteristics often found in old growth trees that can help identify them are:

The bark is more deeply furrowed and more weathered on old growth trees than on young growth trees, often having a plated appearance. Bark scorching may be heavier on old growth trees, indicating that they were present during fires that occurred before the first logging in the Forest. A tree size that is larger than would be expected for the stand age, management history, and site quality may indicate an old growth tree. Limbs often significantly larger in diameter than expected for the stand age, site quality, and canopy closure may indicate an old growth tree. Limbs often extend from the trunk at more of a downward angle than is common in younger trees.

Old-growth conifers that also have one or more of the following structural characteristics will be retained unless specified otherwise in the Plan:

- a) DBH greater than 48 inches.
- b) Goose-pen (an opening one foot or more in diameter inside and above the top of the trunk opening).
- c) Platform branches greater than 8 inches in diameter.
- d) Exfoliating flanged bark slabs.
- e) Chimney top (hollowed upper stem)
- f) Dead top at least 16 inches in diameter and 16 feet long.

Guidelines for Protecting Old Growth Trees and Reserves

Old growth conifers with any of the attributes described in a. through f. above will be retained in any prescription unless the tree presents a public safety issue or retention would result in the potential for greater long-term environmental damage, including but not limited to issues related to road and landing sites, soil instability, damage to aquatic resources, or cable yarding requirements.

Since it is often difficult to visually distinguish between young growth and old growth hardwoods, size will serve as a surrogate for age. All hardwoods 36" DBH + will be considered for retention, as will other hardwoods that appear to be old growth and possess characteristics similar to those in a. through f. above. Where forest stands appear to have greater hardwood site occupancy than in the past, hardwoods of any age may be removed to restore former species balance, favoring old growth hardwoods for retention whenever appropriate.

Old Growth Grove Reserves

Known old growth stands have been identified and will be retained. No harvesting shall occur in the reserved old growth groves.

Old Growth Aggregations

An old growth aggregation is defined as an obvious, intact, undisturbed remnant of the original stand, with an area of at least two acres. Delineating the boundary of an aggregation will be guided by the principle that a gap of 200 feet or more between trees breaks the continuity of a potential aggregation. No trees, young or old, shall be designated for harvesting in an old growth aggregation, except as necessary for the construction or use of truck roads, landings, skid trails, cable corridors, tail holds and guy anchors needed for timber harvesting. All identified aggregations will be mapped. No old growth trees within aggregations will be removed unless the tree presents a public safety issue or retention would result in the potential for greater long-term environmental damage, including but not limited to issues related to road and landing sites, soil instability, damage to aquatic resources, or cable yarding requirements

Wildlife Species of Concern

Species Surveys

1. Pre-Project Scoping

Pre-project scoping will occur prior to conducting pre-project focused species surveys. JDSF will engage in a scoping process to identify those special status species likely to occur in the affected environment of a project area and potential risk of negative effects. A variety of sources of information will typically be consulted and contribute to the planning process. These include the California Natural Diversity Database, JDSF GIS database, as well as a variety of completed forest-wide survey and focused species' inventory and research efforts. The scoping process will evaluate likelihood of species presence, habitat availability, survey methodology and timing, and possible mitigations or opportunities for habitat enhancement. Population density and detectability of the special status species, habitats occupied, and the level of habitat disturbance expected from the land management action guide survey intensity. Current literature and species authorities will be consulted as necessary.

2. Training

JDSF will provide for, on an as-needed basis, a sensitive wildlife identification training program to enhance the ability of field personnel to recognize these resources. Personnel who will be responsible for NSO and MAMU surveys will meet the USF&WS and/or CDFG recommended qualifications for conducting the appropriate survey. JDSF also supports personnel seeking more formal instruction and training in this area.

3. Biological Survey

Surveys conducted for special status animal species, when indicated following pre-project scoping, will be to established protocols, after consultation with federal or state wildlife management agencies as appropriate, or practices commonly accepted by CDF and CDFG for Timber Harvesting Plan review. In general these species are listed and may be among those considered Species of Special Concern by the California Natural Diversity Database or otherwise recognized by State or federal endangered species acts. Surveys for special status species will include suitable habitat within the proposed project impact area and inquiries regarding occupancy or suitable habitat off-site that may be affected by project implementation. Surveys, irrespective of the state of protocol development, are conducted at a time of year that facilitates positive identification and maximizes the likelihood of contact in the field. Observations of rare, threatened or endangered plants, animals or plant communities will be recorded on Field Survey Forms and copies provided to the CDFG California Natural Diversity Database (CNDDDB).

As JDSF rebuilds staff, expertise and research capacity, an improved understanding of biological resources will be built. At this point in time JDSF must rely on current sources of predictive habitat relationship models, occurrence data, and pre-project scoping that is followed by focused survey effort for special status species as necessary. Included are continued development of a forest GIS database of species occurrence, data capture from prior project survey effort, and forest wide research/survey results completed by other agencies and academia. It is expected that over time and with consistent data capture in JDSF's database that improvement in the predictability of the status and occurrence of special status species will emerge. Floristic and faunistic survey effort to address the occurrence of all-species regardless of status remains a managerial option pending need and resource and personnel availability.

Northern Spotted Owl Conservation Strategy

Habitat Protection

- Habitat protections provided for existing activity sites are described in detail in the Forest Practice Rules. Activity sites are considered a nest or primary roost site occupied by a pair of birds irrespective of their reproductive success. Activity sites represent a confirmed pair or primary roost site at least one year in three years. Activity sites are protected with a 1,000-foot radius disturbance buffer and other measures to prevent take as described in the Forest Practice Rules.

Species Protection

- All proposed timber harvesting plans containing suitable nesting or roosting habitat will continue to be surveyed following established survey protocols endorsed by the responsible state or federal agency.
- All timber operations within the buffer of an active site will occur outside of any seasonal closure to prevent disturbance. The determination of seasonal closure dates to prevent disturbance during the nesting period are described in the Forest Practice Rules (919.9 and 919.10).

Habitat Management Practices

- Within 500 feet of the nest site, habitat will be retained as follows: 25 percent of area composed of trees greater than 11 inches DBH and 60 percent or greater canopy cover. 75 percent of area composed of trees greater than 24 inches DBH and 60 percent or greater canopy cover. Trees greater than 24 inches DBH and over a distinct layer of trees of 6-24 inches DBH and greater than 60 percent canopy closure may contribute to the 75 percent.
- Within 500-1000 feet of the nest or roost site habitat will be retained as follows: trees greater than 11 inches DBH and greater than 40 percent canopy closure.
- Within a 0.7-mile radius of the activity site 500 acres of habitat will be provided (inclusive of the 1000 foot radius buffer above).
- Within a 1.3 mile radius of the activity site 1336 acres of habitat will be provided (inclusive of the 0.7-mile radius buffer above).

Osprey Conservation Strategy

Habitat Protection

- Osprey nest trees will be protected with a buffer zone using topography to minimize disturbance to the maximum extent possible. Disturbance buffer location and configuration will be determined in consultation with the California Department of Fish and Game (CDFG).

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- A nest site will be considered unoccupied and protection standards do not apply if after a period of 3 years occupancy cannot be documented. However, the nest tree and any associated screen trees will be protected.
- Protect perch, screen and pilot trees identified in consultation with CDFG. These trees will be designated in the interest of long-term occupancy of the territory and not based just on an individual bird's tolerance or accommodation of disturbance.

Species Protection

- Nests within the boundaries of the proposed management activity or unit of treatment will be surveyed prior to operations to assess occupancy. These surveys will also be conducted within the largest disturbance buffer established (see below). Nest surveys are defined as two visits of up to 3 hours long to the nest site and distributed across the nesting period to assess occupancy.
- All timber operations within the buffer of an occupied nest site will occur outside of any seasonal closure to prevent disturbance to occupied nests. The critical period that defines seasonal closure dates to prevent disturbance during the nesting period is described in the Forest Practice Rules (919.3(d)(5) as March 1 to April 15, extended to August 1 for occupied nests) unless site-specific conditions warrant otherwise. CDFG will determine the need for modification of seasonal closure dates.
- Disturbance buffers (within which the seasonal closure will apply) specific to management activities will be established per the Forest Practice Rules.
- There shall be no log hauling within 300 feet of an active nest during the nesting and fledging seasons. The log-hauling buffer shall not apply for nest sites within 300 ft of permanent haul roads when there is no other feasible existing haul route available.

Habitat Management Practices

- Nests within the boundaries of the proposed management activity or unit of treatment will be surveyed prior to operations to assess occupancy. These surveys will also be conducted within the largest disturbance buffer established (see below). Nest surveys are defined as two visits of up to 3 hours long to the nest site and distributed across the nesting period to assess occupancy.
- All timber operations within the buffer of an occupied nest site will occur outside of any seasonal closure to prevent disturbance to occupied nests. The critical period that defines seasonal closure dates to prevent disturbance during the nesting period is described in the Forest Practice Rules (919.3(d)(5) as March 1 to April 15, extended to August 1 for occupied nests) unless site-specific conditions warrant otherwise. CDFG will determine the need for modification of seasonal closure dates.
- Disturbance buffers (within which the seasonal closure will apply) specific to management activities will be established per the Forest Practice Rules.
- There shall be no log hauling within 300 feet of an active nest during the nesting and fledging seasons. The log-hauling buffer shall not apply for nest sites within 300 ft of permanent haul roads when there is no other feasible existing haul route available.

Marbled Murrelet

CDF will conduct an assessment to determine which areas offer the greatest potential for current and future Marbled Murrelet habitat. CDF has identified key areas for assessment of their suitability for current habitat and for future potential marbled murrelet habitat development and species recovery: Russian Gulch, Lower Big River, Mitchell/Jughandle Creek, and lower Hare Creek. The assessment process is described in Chapter 3.

Habitat Protection

- Marbled Murrelet Augmentation Areas will be managed to recruit late seral habitat conditions. The location of these areas will be determined by the assessment process described in Chapter 3.

Species Protection

- Surveys to protocol endorsed by CDFG will be conducted on all project sites with potential habitat and include the largest disturbance buffer established (see below) if management activities have the potential to affect occupied marbled murrelet habitat and management activities are to be conducted within the seasonal closure period to prevent disturbance.
- The marbled murrelet breeding season and disturbance seasonal closure is March 24 through September 15. From August 6 through September 15 there will be no operations until two hours after sunrise and no operations within the buffer area after two hours prior to sunset to prevent disturbance to occupied habitat areas, unless protocol surveys document murrelet absence.
- Disturbance buffers (within which the seasonal closure will apply) specific to management activities will be established as follows as measured from the occupied nest site:
 - Blasting operations: one mile.
 - Helicopter use: within 1/4 mile.

Habitat Management Practices

- THPs that are proposed adjacent to marbled murrelet augmentation areas will provide a 100 to 300 foot special silvicultural zone (single-tree selection managing for large trees) depending on silvicultural prescription adjacent to augmented and old-growth groves. Uneven-aged units adjacent to the augmented groves will receive a 100-foot special silvicultural zone; even-aged units will receive 300 foot special silvicultural zone.
- Special silvicultural zones will be subject to harvest activities but only during times outside of the seasonal closure for disturbance or if protocol surveys document the absence of murrelets.

Northern Goshawk and Cooper's Hawk

The northern goshawk is not currently known to inhabit JDSF or adjacent lands, but may be present.

Species Protection

- Northern goshawk and Cooper's hawk surveys will be conducted in potential habitat areas subject to timber management activity and include the largest disturbance buffer to be established for that management activity (see below).
- Occupied northern goshawk nest sites and associated habitat (including perch, screen, and

pilot trees) will be protected and mapped when the species is located during Timber Harvesting Plan preparation or other project surveys. The area protected will include the nest site (100 acres) and Post Fledging Area (PFA) (300 acres). Cooper's hawk nest sites will be provided protections after consultation with CDFG.

- All timber operations will occur outside of any seasonal closure to prevent disturbance to active sites. The critical period that defines seasonal closure dates to prevent disturbance is described in the Forest Practice Rules (919.3(d)(4) March 15-August 15) unless site-specific conditions warrant otherwise. CDFG will determine the need for modification of seasonal closure dates and those required for Cooper's hawk.
- Disturbance buffers (within which the seasonal closure will apply) specific to management activities will be established in accordance with the Forest Practice Rules.
- CDFG will be notified when nesting northern goshawk or Cooper's hawks are detected to facilitate enforcement of falconry laws.

Habitat Management Practices

- Vegetation structure of an active northern goshawk nest site and post fledging area (PFA) will be managed outside of the seasonal closure established for disturbance to attain the following structural characteristics:
- Nest Site: for goshawk nest sites maintain CWHR 5D or 6 (if not available, then CWHR 4D) or other condition derived by an interagency prescription team that includes representation from CDFG and CDF.
- PFA: interagency prescription team will meet to develop details on silvicultural prescriptions to be applied.
- Vegetation structural stage objectives for nest site and PFA conditions may be altered under an adaptive management approach as additional data is acquired regarding northern goshawk habitat requirements in redwood and Douglas-fir forests.

Vaux's Swift and Purple Martin

Habitat Protection

- Retain trees exhibiting cavities considered suitable for Vaux's swift and purple martin that do not interfere with the development of required forest infrastructure.
- In even-aged regeneration silvicultural treatments (including clearcut, shelterwood, seed tree seed step, and shelterwood or seed tree removal) and group selection, all snags will be retained unless representing a worker safety or fire control issue. Wildlife Mitigation 1 has expanded the retention standards to all harvests.

Habitat Management Practices

- Within the WLPZ, recruit snags by retaining large fir trees as a stand component.
- Salvage of dead or dying trees will not occur within the WLPZ, old-growth augmentation area, species specific management area described in a habitat conservation strategy. Exceptions may exist in response to large-scale occurrence of fire, insect attack, windthrow, or threat to infrastructure.
- Snags reflective of the range of conifer species present will be recruited within or nearby even-aged and small group selection areas. Snag recruitment trees will be clustered if

practicable specifically in areas that are considered important to purple martin: ridge lines, adjacent to ponds or other natural forest openings, or areas of prevailing wind.

Sonoma Vole

Sonoma vole management issues are specific to the maintenance of habitat connectivity and forest tree species composition.

Habitat Protection

- Potential habitat is defined as those areas that are at least 40 percent forested by trees greater than 11 inches DBH, 60 percent canopy closure and a high proportion of Douglas-fir.
- Management will maintain a significant area of potential habitat in a connected state with a significant component of Douglas-fir. It is anticipated that uneven-aged management, stream zones, and other connected patches of timber meeting the potential habitat definition will accomplish this goal.

Species Protection

- CDF will encourage a research effort to examine Sonoma vole habitat, seral stage use and habitat connectivity requirements in JDSF and adaptively manage for the species based on results.

Habitat Management Practices

- Each planning watershed will maintain a significant Douglas-fir component.

Plant Species of Concern (also in December 2005 DEIR Page VII.6.21)

Surveys

Guidelines for Plant Species Surveys and Avoidance of Significant Impacts

Rare, threatened, and endangered species, as defined by Section 15380 of the CEQA Guidelines, will be addressed during the scoping, surveying, and mitigation-development processes. For species that do not meet the Section 15380 definitions of a rare, threatened, or endangered species but that are CNPS list 3 or 4 species, evaluation, scoping, and mitigation practices are likely to vary according to identified need, the current state of species knowledge, and consideration of input provided by CDFG through the scoping process.

Scoping

The scoping process would normally begin with the identification of sensitive species and their habitats that may be affected by the project and are of management concern. For habitat issues, the scoping process may include habitat issue characteristics, a description of presence in the assessment area, and where potentially impacted, a description of the potential impact, measures to minimize the impacts, and an analysis of significance. For individual species, project-associated risks, limiting factors and current status will be considered. Project specific review may include an evaluation of the availability, quality, and quantity of suitable species habitat within the project and assessment area including an evaluation of known actual or potential presence of the species. To be thorough, the pre-project scoping process will include referencing JDSF plant list from the EIR and current updates, available database information from the California Natural Diversity Database and CNPS Inventory, and other sources of sensitive plant habitat and occurrence data.

Surveys

When suitable habitat is present within or immediately adjacent to the project area, project-planning documentation will include surveys as described below, and a discussion of the efforts made to determine presence or absence of the species in question. An assessment area that extends beyond the boundaries of the planned activity may also be required for some species.

For timber harvest plans and other large projects with the potential for negative effects on rare plants, JDSF shall follow the Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities (CDFG 2000). On smaller scale projects, the survey effort will be appropriate for the level of CEQA analysis and the risk of impact to rare plants.

Observations of rare, threatened, or endangered plants or plant communities will be recorded on field survey forms and copies provided for the California Natural Diversity Database (CNDDDB).

Mitigation Development

Upon determination that a proposed action is likely to result in a significant adverse effect, mitigation measures proposed to substantially lessen or avoid the impact will be included in project-associated documentation. Avoidance measures and other necessary mitigations will be specified. Some projects will require consultation with DFG Botanist and an adaptive management approach. An example is conducting invasive weed control and road maintenance in areas with existing or potential Humboldt milk-vetch (*Astragalus agnicidus*) occurrences.

Improving Knowledge of Rare Plants

JDSF will provide for, on an as-needed basis, a sensitive plant identification-training program to enhance the knowledge of field personnel that may encounter sensitive plant resources. Personnel who will be responsible for botanical surveys should meet the recommended qualifications for botanical consultants included in the DFG survey guidelines (DFG 2000).

Additional Botanical Management Measure 1 (Invasive Weed Management and Rare Plants)

Protection of rare plants (candidate, sensitive, or special status species) from invasive plants will be a high priority for Integrated Weed Management activities. Although the analysis did not find mitigation necessary to prevent the project alternative from impacting rare plants due to invasive species, this Additional Management Measure was developed to provide further protection.

Some examples of project-specific mitigation include: retaining canopy cover for rare plants that favor this condition while discouraging invasive plants that favor more sunlight, and planning continued monitoring for rare plant occurrences in areas at risk for invasive plant infestations.

Implementation and effectiveness monitoring would occur during the course of project implementation, as well as post-operation, including timber sale follow-up, such as erosion control maintenance inspections, and road maintenance surveys.

Monitoring:

Timing: During the life of the JDSF Management Plan

Scope: Forest-wide, Implementation: CDF

Protection of rare plants (candidate, sensitive or special status species) from invasive plants will be a high priority for Integrated Weed Management activities. Although the analysis did not find mitigation necessary to prevent the project alternative from impacting rare plants due to invasive species, this Supplemental Mitigation was developed to provide further protection.

Some examples of project-specific mitigation include: retaining canopy cover for rare plants that favor this condition while discouraging invasive plants that favor more sunlight, and planning continued monitoring for rare plant occurrences in areas at risk for invasive plant infestations.

Recreation and Aesthetics

Aesthetics (also in December 2005 DEIR VII.2-15)

Mitigation 1:

For even-aged timber harvest plans, conduct field evaluations by a RPF or his or her designee to determine the visibility of the THP area to the Forest visitor as seen from roads, trails, and recreation areas. Evaluations will include, but be not limited to, consideration of the following factors:

- the potential frequency of viewing by the general public,
- the degree and duration of vistas,
- the general topography of the THP area in relation to the view aspect,
- and type and density of forest canopy and understory cover of forest areas surrounding the THP area.

The RPF will make a finding of whether or not the evaluation leads to a conclusion that a significant impact to a scenic vista exists. Where appropriate, to visually soften and mitigate significant impacts created by even-aged management on the integrity of scenic views from designated overlooks visible to significant numbers of general forest visitors, the THP shall include one or a combination of the following: modify the configuration of the harvest area to better reflect topography and natural patch shapes; modify the configuration of the harvest area to avoid spanning ridgelines in whole, or in part; reduce the size of the individual harvests units and/or total harvest area; or leave selected standing trees along the harvest edge boundaries.

Monitoring 1.

Timing:	During the life of the JDSF Management Plan
Scope:	Even-aged management THPs
Implementation:	CDF
Monitoring Responsibility:	CDF

Mitigation 2. (also in December 2005 DEIR Page VII.2-18)

For all timber harvest plans conducted within or adjacent to Special Treatment Areas or buffer areas that are identified but not specifically defined in the DFMP, conduct field evaluations by a qualified RPF or other qualified professional, as determined by CDF, to determine the visibility of the THP area. Evaluation will consider, but not be limited to:

- the potential frequency of viewing by the general public,
- the degree and duration of views from areas of concern;
- presence of distinctive visual attributes such as rock outcrops, streams, or distinctive flora;
- type and density of forest canopy and understory cover;
- and general topography in relation to the view aspect.

Evaluations should take into account the configuration of the THP in relation to the areas around it. The RPF will make a finding whether or not the evaluation leads to a conclusion that a significant impact to a scenic vista exists. Where appropriate to visually screen views from Special Concern Areas, the Mendocino Woodlands State Park and Outdoor Center, and other state park units adjacent to JDSF, or to direct views to provide desirable vistas, modify the width

of the buffer appropriately (wider or narrower). Designate timber harvest practices within buffer areas to be one or a combination of single-tree selection, hazard tree removal, or no harvesting, as appropriate.

To address impacts on the visual character and integrity of the JDSF, no harvesting or some form of restricted timber harvesting within the 23 identified Special Concern Areas. The DFMP also provides for buffers around some Special Concern Areas and other forest resources that would mitigate the impacts of timber management on aesthetic resource. Buffers that are specifically defined in the DFMP are:

- **Campgrounds and day-use areas buffers** - where timber harvesting within 300 feet of campgrounds and day-use areas will be planned and conducted with the designated site use in mind.
- **Road and trail corridors** - specified 300-foot buffers in the DFMP, plus additional corridors to be considered for designation following recreation user survey.
- **Slash abatement zones** - where main access routes to high-use recreation areas; timber harvest plans will have slash abatement within 50 feet of the road.
- **Non-catastrophic tree mortality and down wood retention zones** - within old-growth management areas, WLPZs, or within 100 feet of old-growth groves.
- **Watercourse and Lake Protection Zones** - where a series of management prescriptions are defined to include, but not be limited to: a 25-foot no-harvest zone; an Equipment Exclusion Zone; leaving uncut the 10 largest trees per 330 feet of stream channel within 50 feet of the watercourse transition line; retaining a minimum of 240 sq. ft. of conifer basal area within the WLPZ following harvest activity; reentry no more frequently than every 20 years in Class I WLPZs; and retention of native hardwoods except where species imbalance has occurred.
- **Neighbor/State Park Buffer Special Concern Area** - a 200-foot zone has been established along all neighboring non-industrial timberland ownerships and State Parks where the silvicultural method has been restricted or scenic values must be considered in selection of an appropriate silvicultural system.
- A 200-foot harvest exclusion buffer from camp areas, recreational cabins, or main roads located within Mendocino Woodlands State Park. This buffer does not apply to the Railroad Gulch Silvicultural Study area.
- 200-foot buffers have historically been considered around residential properties that are adjacent to the Forest boundary. The type of timber management that has occurred within these buffers has been based on discussions with individual property owners.

Monitoring 2.

Timing:	During the life of the JDSF Management Plan
Scope:	THPs within or adjacent to Special Concern Areas
Implementation:	CDF
Monitoring Responsibility:	CDF

Mitigation 3. (also in December 2005 DEIR Page VII.2-20)

Require the Forest Learning Center and Forest interpretive Center to be located and designed in accordance with the CEQA process to not significantly affect day or nighttime views from

campgrounds or residential areas. CEQA processes also shall be followed for any other facilities, not identified at this time, that are proposed at a later date.

Monitoring 3.

Timing:	During facility site selection
Scope:	Forest-wide
Implementation:	CDF
Monitoring Responsibility:	CDF

Mitigation 4: *(also in December 2005 DEIR Page VII.2-26)*

For all timber harvesting plans, the RPF or designee shall conduct field evaluations to determine the visibility of the proposed THP area in combination with the existing viewshed, past, present, and probable future operations, to the Forest visitor as seen from areas of high public use. Evaluations will consider, but not be limited to:

- the potential frequency of viewing by the general public
- the degree of visibility
- duration of view
- general topography of the view area
- character of the forest canopy and understory cover
- visually dominant landscape features
- visual recovery trajectory
- past visual forest management impacts within the viewscape regardless of ownership.

The RPF will make a finding of whether or not the evaluation leads to a conclusion that a significant adverse cumulative impact to a scenic vista exists.

This mitigation must be applied to areas including but not limited to all foreground views (views up to 200 feet), to the middleground vistas looking into James Creek from Highway 20 and the surrounding viewscape from the Camp 20 Recreation Area from Highway 20, and any identified background views of JDSF seen from areas of high public use.

Where appropriate to maintain visual quality and to mitigate cumulative impacts created by forest management on the integrity of scenic views, the THP shall include one or a combination of the following:

- modify the project to reflect the natural character of the landscape
- incorporate edge treatments into the design of the proposed operation (feathered edges, irregular harvest unit design, etc.)
- create islands or patches of trees to mitigate visual impacts under silvicultural methods involving the use of variable retention
- retain stems under an appropriate silvicultural prescription to maintain visual quality
- minimize major visual lines if not in character with the viewed landscape.
- modify the size, shape and configuration to fit the character of the surrounding landscape

- delay harvest until the visible landscape has recovered a forested appearance

Monitoring.

Timing: During the life of the JDSF Management Plan
Scope: All proposed THPs
Implementation: CDF
Monitoring Responsibility: CDF

Noise (also in December 2005 DEIR VII.12)

Mitigation 1

While timber operations are generally limited to daylight hours when many people are away from home, logging adjacent to rural residential homes and neighborhoods will generate noise. Noise will be mitigated on a site-specific basis, taking into account the nature of the area and the inhabitants, or receptors. Options to reduce noise impacts might include limiting operations to weekdays, keeping landings and heavy equipment as far away from receptors as feasible, and where necessary, utilizing methods and machinery that are less noisy.

Mitigation Monitoring:

Timing: During the life of the JDSF Management Plan
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF
Parameters to be Monitored: Noise levels created by site-specific project activity near rural residential neighborhoods adjacent to JDSF.

Mitigation 2

Active timber operations within the vicinity of occupied campgrounds and picnic areas will be limited to weekdays and non-holidays. Noise abatement mitigation will be included in any timber sale within 100 feet of an open campground or within 200 feet of a residence, park, or other identified sensitive receptor. Camp hosts will be kept informed of activities associated with timber operations affecting campgrounds under their jurisdiction.

Noise impacts on wildlife can be mitigated by avoiding nesting/breeding areas of noise-sensitive listed species during the critical reproductive and young-rearing months. JDSF will conduct area-wide wildlife surveys in viable habitats for listed species for one or more years prior to commencement of operations wherever timber operations are proposed. The data will be incorporated with other known locations of wildlife, both on and off the property, helping staff design operations for minimal impact to sensitive and listed species on the Jackson Demonstration State Forest.

Helicopter-Mitigation 2

Any proposed helicopter logging will use the Mendocino General Plan standards for residential dwellings in rural suburban communities as a guide in estimating noise impacts of specific timber harvest operations. Potential noise levels can generally be determined by considering the equipment used, time of use, terrain, and distance to sensitive receptors.

The following helicopter flight characteristics will be considered in the design of timber management operations to further mitigate noise impacts within and adjacent to JDSF where sensitive receptors are identified:

- Buffer helicopter pads by using ridges or other solid sound attenuating landscape features where available and practical.
- Design helicopter flight paths to provide buffering distance from hiking trails, campgrounds, and nest sites of listed species.
- Where practical, design helicopter flight paths using terrain features that would reduce noise reception by sensitive receptors (i.e. fly behind ridges).
- Limit times of day for helicopter use to reduce impacts when operating near residential neighborhoods and occupied campgrounds.
- Logging operations will increase ambient noise levels near an active timber harvest; however, given the temporary, remote and seasonal nature of timber harvest, the above mitigation measures will reduce noise impacts to a less than significant level.

Mitigation Monitoring:

Timing: During the life of the JDSF Management Plan
Scope: Forest-wide
Implementation: CDF using a sound level meter
Monitoring Responsibility: CDF
Parameters to be Monitored: Noise levels created by site-specific project activity
Performance Criteria: Noise levels remain near or below standards within County General Plan

Additional helicopter mitigations in FMP: (not in the above December 2005 DEIR list)

- Active operations will be limited to weekdays and non-holidays.
- Noise abatement will be included in a THP within 1000' of an open campground or 200' of a residence, part or other identified sensitive receptor.
- Camp-hosts will be informed of timber operations affecting campgrounds under their jurisdiction.
- In addition, noise impacts on nest sites of listed species and neighbors will be considered in decisions to prescribe helicopter use in logging operations.

Mitigation 3

Noise-generating management activities will be assessed for cumulative noise effects, and JDSF will incorporate mitigation measures to minimize them. Examples of mitigation that can be applied to projects include alteration of project methods, timing, location, scope, and duration. Trees have potential to buffer ambient (chronic) highway and residential noise, and site-specific retention should be considered to reduce potential impacts to residents or recreationalists.

Target shooting and chainsaws (firewood cutting) are generally the noisiest recreational activities, with potential individual and cumulative noise impact that may not be mitigated by distance. JDSF controls firewood cutting through the use of permits, so firewood collection locations can be controlled. Recreational shooting is not a controlled activity on the State Forest, although it is prohibited in specified areas around Mendocino Woodlands and the Parlin Fork and Chamberlain Creek Conservation Camps.. For harvesting and construction activities, mitigating noise to a level

that is less than significant is accomplished by limiting days and hours of operation, as well as providing buffering distance, taking advantage of topographic features, and time between noise-creating activity and nearby sensitive receptors, and using equipment that makes less noise.

A precise estimate of noise produced in future projects is not possible, however noise can be predicted, mitigated, and monitored on projects as they are designed.

Mitigation Monitoring:

Timing: During the life of the JDSF Management Plan
Scope: Forest-wide
Implementation: CDF
Monitoring Responsibility: CDF
Parameters to be Monitored: Noise levels created by management or recreational activity near rural residential neighborhoods adjacent to JDSF and near recreation sites within JDSF.

Recreation

Campground buffers

Areas immediately adjacent to campgrounds that are managed for public safety and aesthetic enjoyment. Even-aged silviculture is not allowed within the campground buffers.

Road and trail corridors

Buffer areas along specified trails and roads to maintain aesthetic qualities desired by the public. Only a limited range of uneven-aged silviculture is allowed in these areas.

Forest Protection *(also in December 2005 DEIR Page VII.6.4-12)*

State Forest staff will continue to monitor the Forest for early signs of forest pests or conditions that may lead to infestation. JDSF personnel will also assist the pest-monitoring program of the California Department of Food and Agriculture by allowing deployment and inspection of gypsy moth traps in high use areas of the Forest [DFMP, Chapter 3]. Specific management actions are included in DFMP Chapter 3 for both SOD and Pitch Canker.

Prescribed fire

Prescribed fire only under prescription and on permissive burn days with necessary permits from the MCAQMD.

Research and Demonstration

The varied nature of proposed research projects precludes applying specific mitigation measures to each proposed project. Rather, each project will need scoping and further assessment to determine the applicable mitigations needed, refer to pertinent mitigations listed above for the resource potentially affected. Specific additional mitigations are listed below that are not included in this Appendix or they are listed here as they are specific to Research and Demonstration.

Research projects incorporating manipulation of forest stands and vegetation

As part of JDSF's research and demonstration mission, small-scale herbicide trials or vegetation control studies are appropriate. These activities may utilize products that are not listed in the EIR.

Fertilization will not be used as a stand improvement practice on JDSF except in conjunction with a specific research project. No fertilization research projects are currently under consideration.

The possibility of removal of Pygmy Forest vegetation by prescribed fire was noted in the DFMP with reference to the habitat development for the Lotus Blue Butterfly. The EIR recognizes that this type of project should be given careful analysis by qualified botanist in addition to species surveys and mitigation measures detailed previously. T. Sholars has described some possible restoration and research projects involving prescribed fire for Pygmy forest on JDSF (1997).

Development and Construction of the Learning and Interpretive Centers

A Forest Learning Center complex and JDSF Interpretive Center at Camp 20 are both listed as potential on-site actions within the EIR. These actions will be subject to separate, project-specific heritage resources review per CEQA and/or Section 106 of the NHPA.

Specific mitigations developed for these projects are:

(EIR Aesthetics) Mitigation 2. For all timber harvest plans conducted within or adjacent to Special Treatment Areas or buffer areas that are identified but not specifically defined in the DFMP, conduct field evaluations by a qualified RPF or other qualified professional, as determined by CDF, to determine the visibility of the THP area. Evaluation will consider, but not be limited to:

- the potential frequency of viewing by the general public,
- the degree and duration of views from areas of concern;
- presence of distinctive visual attributes such as rock outcrops, streams, or distinctive flora;
- type and density of forest canopy and understory cover;
- and general topography in relation to the view aspect.

Evaluations should take into account the configuration of the THP in relation to the areas around it. The RPF will make a finding whether or not the evaluation leads to a conclusion that a significant impact to a scenic vista exists. Where appropriate to visually screen views from Special Concern Areas, the Mendocino Woodlands State Park and Outdoor Center, and other state park units adjacent to JDSF, or to direct views to provide desirable vistas, modify the width of the buffer appropriately (wider or narrower). Designate timber harvest practices within buffer areas to be one or a combination of single-tree selection, hazard tree removal, or no harvesting, as appropriate.

Monitoring 2.

Timing: During the life of the JDSF Management Plan

Scope: THPs within or adjacent to Special Concern Areas

Implementation: the Department

Monitoring Responsibility: the Department

The development and construction of both the Learning Center and Interpretive Center are both listed as potential on-site actions within the EIR. Specific aesthetic mitigations developed for these projects are:

(EIR Aesthetics) Mitigation 3: Require the Forest Learning Center and Forest interpretive Center to be located and designed in accordance with the CEQA process to not significantly affect day or nighttime views from campgrounds or residential areas. CEQA processes also shall be followed for any other facilities, not identified at this time, that are proposed at a later date.

Monitoring 3.

Timing: During facility site selection

Scope: Forest-wide

Implementation: the Department

Monitoring Responsibility: the Department

Refer to mitigations and monitoring requirements contained within this management plan:
Chapter 3 – Recreation, Aesthetics and Public Use.

(EIR Heritage Resources) Mitigation Measure 18. When planning for or reviewing proposed demonstration and research projects that have the potential to disturb significant heritage resources, employ standard procedures described in *Archaeological Review Procedures for CDF Projects* (Foster 2003), and in the *Forest Practice Rules for the Protection of Archaeological and Historical, and Cultural Sites* (CDF 2003), and include a check of the current JDSF heritage resource database to include review of historic period sites identified by Gary and Hines (1992) to avoid potential impacts to significant heritage resources. Document heritage resources study findings in the CDF archaeological Report form, or other report format consistent with OHP (1989) guidelines.

Monitoring 18.

Timing: During life of the JDSF Management Plan

Scope: Forest-wide

Implementation: the Department

Monitoring Responsibility: the Department