V. ENVIRONMENTAL SETTING

1. INTRODUCTION

The CEQA Guidelines §15125 state that an "…EIR must include a description of the physical environmental conditions in the vicinity of the project…from both a local and regional perspective." The environmental setting generally constitutes the "baseline condition and is relied upon by the lead agency in determining whether an impact, associated with the proposed project, is significant (see No Project Alternatives discussion in Section VI). This section provides an overview of environmental setting information from both the regional and local perspective. More detailed project setting information, including as it relates to potential project impacts, is provided in the Resource Specific Analysis sections (Section VII) by subject area. The individual subsections within Section VII often examine the setting at several nested levels (e.g., North Coast region, Mendocino County, cumulative watershed effects assessment area, JDSF ownership). The Cumulative Effects section (Section VIII) provides further information in the environmental setting. Further setting-related information can be found in several of the appendices. Taken as a whole, Section V, Section VII, Section VIII, and the appendices provide a detailed description of the setting for the proposed JDSF management plan.

2. REGIONAL SETTING

Location

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

JDSF includes portions of the Noyo and Big River watersheds, as well as several small watersheds that drain directly to the Pacific Ocean. The watershed assessment area designated for this EIR encompasses the entire Noyo and Big River watersheds, as well as several smaller coastal watersheds between the mouths of the Noyo River and Big River.

JDSF covers approximately 48,652 acres in central Mendocino County (see Map Figure A). It varies from 2½ to 8 miles wide in a north-south direction, and is about 16½ miles long on the east-west axis. Its western boundary is within 1.5 miles of the coast, and the eastern boundary generally lies on the crest of the Mendocino Ridge separating the coastal slopes from the inland valleys, approximately 7 miles west of Willits.

The JDSF boundary is irregular, especially at the western end where the property line follows section and subsection lines. There are 11 privately owned parcels within the outer border of JDSF (called “inholdings”), with most in the southwest corner. A large private ownership extends into the middle of JDSF from the south.

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

Forest Ownership and Management Trends[1]

The North Coast of California is characterized by extensive areas of private forest land along the western portions of the counties, and a mix of private forests, public forests, and non-forest lands in the eastern portions of the counties. Redwood dominates the cool, fog influenced coastal regions while Douglas-fir and other tree species are more common farther inland. The North Coast region, as defined by the USDA Forest Service for their Forest Inventory and Analysis (FIA) program, includes Del Norte, Humboldt, Mendocino, Sonoma, Trinity, and Lake counties (Waddell and Bassett 1996). In 1994, the FIA program completed an inventory of approximately 1.5 million acres of industrial forestlands and 1.9 million acres of non-industrial forestlands in the region. Most of these lands are in the state’s Timberland Production Zone (TPZ) classification, where the land value is taxed based on its revenue potential for timber production and the right to convert to other land uses is restricted (See the California Timberland Productivity Act of 1982, Government Code § 51100 et seq.). Landowners can request county and CDF approval to remove their lands from the TPZ classification (either immediately or over a ten-year period) whereupon their land tax rates increase to market rates that may also include a premium for conversion potential. While most of these lands were purchased and managed for timber production, there are a variety of new approaches to the financing of forest land ownership being developed and utilized within the region.

The North Coast, Mendocino County, JDSF, and the surrounding area have a long history of timber harvesting, reforestation, and other timber management activity that dates back to the mid 1800s in some areas. Figure V.1 presents a graph of harvesting by silviculture type for the cumulative watershed effects assessment area (see Figure V.9) for 1986 through 2004. Other sections of this EIR—including III.5, VII.6.3, VIII, and Map Figures G, H, and I—document timber harvesting in further detail. Timber management activities have been a primary and substantial source of economic activity for the North Coast region and Mendocino County. Forest management has also resulted in environmental impact and social controversy.

Although the development and land use history of the area is somewhat patchy, this region is known to have been occupied by Native peoples for centuries before

[1] For extensive additional information on these and related topics see sections III.5-6 and VII.3.1.

European settlers began to settle as early as the 1600s. By 1860, a major redwood milling operation was established near the mouth of Big River, and by 1885, another major redwood milling operation had been established near the mouth of the Noyo River. Logs were brought down the drainages and to the shores of the Pacific Ocean and loaded onto ships for transport to destinations to the south along the coast. Towns and cities developed along the coast, largely associated with the logging and fishing industries. Railroads were eventually extended inland, and operated for many decades, until being replaced by truck roads in the 1940s. Roads and highways were constructed, with some of the major routes linking the coast to inland areas being paved to accommodate the increasing levels of log transport, and transport of other goods and people between the coastal and interior regions.

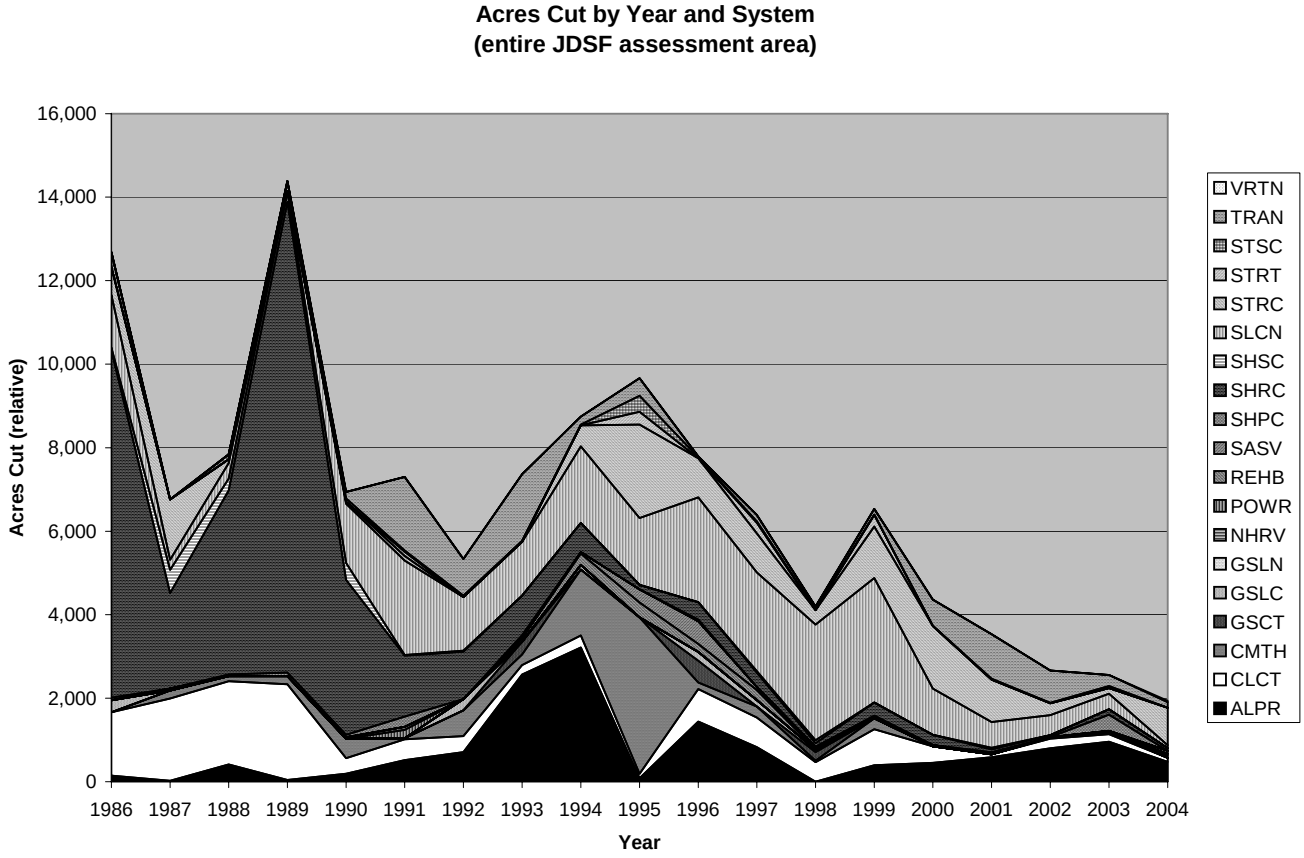

Figure V.1. Acres of Timber Harvest for JDSF Cumulative Watershed Effects Assessment Area, 1986-2004.

Most of the forested areas of Mendocino County have been historically owned and managed as relatively large contiguous entities. The family-owned companies were largely replaced by corporate entities during the 1960s and 1970s, and these corporate ownerships have mostly been replaced by other forms of ownership over the past 10 to 15 years.

Private timberland owners in Mendocino County and elsewhere on the North Coast have been experiencing significantly increased regulatory costs for commercial timber management as the result of increasingly more stringent Forest Practice Rules and water quality protection requirements.[2] At the same time, growing development pressures and the high cash values that subdivision and development opportunities offer make holding forest land for long-term timber production less financially attractive. Under these conditions, it is important for the state to maintain a Demonstration State Forest Program that can help timberland owners maintain economically viable timber production operations.

In central Mendocino County, one of the major industrial timberland owners with holdings adjacent to JDSF, Mendocino Redwood Company, is actively pursuing multi-decade planning agreements (Habitat Conservation Plans, Natural Community Conservation Plans, and Program Timberland EIRs) with state and federal agencies for its entire ownership. Such efforts require very large upfront expenditures on planning and documentation, designed to reduce the future costs and complexities of regulatory compliance related to fish and wildlife habitat needs and species protection. A number of the other major industrial timberland owners have sold some of their lands to state agencies, non-profit entities who establish conservation easements along with an ongoing timber-revenue entity, or have explored the possibility of converting some of their land into other land uses. The 7,300-acre Big River Unit addition to the Mendocino Headlands State Park is located adjacent to JDSF and is one of the more significant transfers of forest land from private (Hawthorne Timber Company) to public ownership in the region.

Another local innovation in land ownership and management is the Garcia River Forest. This project represents a partnership between two non-profit organizations that purchased a large block of industrial timberland. A large tract of industrial forest land was available for purchase, and conversion to smaller units of vineyards and rural residential use was a likely outcome. A Coastal Conservancy grant was used to purchase a conservation easement that is being managed by the Nature Conservancy while the Conservation Fund develops a forest management plan to increase forest inventory. The 25,000-acre property is to be managed to produce a sustainable flow of timber harvest-based revenue to maintain financial viability. This project demonstrates both the growing trend towards the sale of current forestland holdings as well as the growing hands-on activity by non-profits with goals of balancing timber productivity with a high level of environmental protection and enhancement. The Pacific Forest Trust, and other land trust entities, have worked with a number of North Coast nonindustrial landowners to establish conservation easements that restrict landowner development

[2] A 2003 study published by the California Polytechnic State University, San Luis Obispo, concludes, “The ever increasing costs to landowners of complying with the [Forest Practice Rules] leads to less active forest management, which in turn could lead to a degradation in forest health and conversion of forestlands to alternative activities such as development of subdivisions.” (Dicus and Delfino 2003, p. 5.) A more recent study found that, “Landowners facing uncompetitive returns from managing their lands for wildland resource values, like timber, are increasingly inclined to sell their land for higher returns. In California this frequently means conversion to housing, a far more environmentally degrading land use.” (Thompson and Dicus 2005, abstract)

rights while allowing the landowners to continue to manage their lands for sustainable timber and livestock production.

The current land use setting in Mendocino County and most of the area surrounding JDSF is characterized by large, contiguous areas of forest that are relatively unfragmented by residential development or agricultural land uses. However, changes in large industrial timberland owner management plans are not the only land use changes that could affect the current environment. There are thousands of vacant parcels (Table V.1) that could be developed, with potential to significantly alter existing forest cover in the areas surrounding JDSF (Fort Bragg, Mendocino, and Willits). For example, the Brooktrails development area is currently forested and has an additional 4,623 vacant parcels that could be developed.

Table V.1. Vacant Parcels in Residential Use and Resource Use.

Type of Parcels within the Forested Vicinity Surrounding JDSF	Total Parcels	Maximum Acres
1 - 10 acre residential parcels	1,398	6,549
11-40 acre residential parcels	305	7,080
Forestland parcels	1,091	83,077
Source: Pacific Municipal Consultants 2003.		

Changes in the current pattern of private forestland ownership could have significant environmental impacts near JDSF and throughout the entire region. If forestland owners of any size determine that revenue from timber harvest is insufficient or that the risks associated with land ownership and the regulatory environment are too great, they are likely to explore the option of selling the land or converting to other land uses. Current values for residential and agricultural land uses are often considerably higher than those for timberland. To the degree that state, local, or private foundation funds are available, it is possible that some of the lands will be bought for conversion to parks. Another approach is financing long term forest land use by capitalizing the development value via the sale of the residential conversion rights through a conservation easement, while continuing the revenue-producing land use based on sustainable timber harvesting or other resource management practices. Conservation easements have been used for decades in Marin and Sonoma counties to stabilize the maintenance of unfragmented private lands by increasing the financial viability of resource-based land use such as grazing, dairy operations, or timber management.

Surrounding Land Use[3]

Within central Mendocino County, lands to the north and south of JDSF are classified as Forest Lands (FL) in the Mendocino County General Plan. Lands directly on the

[3] For extensive information on the land use setting, see Section VII.11 of this EIR.

eastern boundary of JDSF are classified as FL and Range Land (RL). Further to the east are the large areas of Rural Residential (RR) as well as the thousands of smaller residential lots in the Brooktrails development. The Land Use Classifications for the west side of JDSF are Rural Residential (RR), Remote Residential (RMR), Public Service (PS) and Solid Waste Landfill (SW) (Mendocino County 2003). In addition to the many vacant lots within these residential areas to the east and west of JDSF, there is the potential for parcel splitting of current residential parcels, as well as a longer term potential for conversion of larger forest parcels (see Map Figure X in the attached Map Figures section). A potential area of conflict exists where Rural Residential areas are immediately adjacent to areas where timber harvesting or other activities involving heavy equipment are conducted. Examples of possible indirect impacts are changes in aesthetics, alteration of wildlife habitats, and noise impacts.

The DFMP discusses the potential purchase of inholdings within JDSF (DFMP, pages 7, 86, and 87).[4] The majority of inholdings are located within the western portion of JDSF, generally between County Roads 408 and 409. There is one inholding located near Mendocino Woodlands, within the southwest portion of the property, and one inholding located in the eastern portion of JDSF, within the James Creek watershed. These inholdings could be incorporated into the Forest through either land or timber trades with willing neighbors.

There is one major outholding of approximately 800 acres, located on the east side of Mendocino Woodlands near the confluence of the Little North Fork Big River with the mainstem. JDSF's property configuration also could be adjusted through minor property boundary changes. These areas include Riley Ridge (between the South Fork Noyo and Noyo River), Three Chop Ridge (between Big River and Noyo River), and various locations along the southern boundary of the Forest. Private timber companies generally own these areas, which make the adjustments potentially feasible through either land or timber trade with adjacent owners.

Climate

The Pacific Ocean is a moderating influence on the climate of the region. JDSF has a Mediterranean climate, characterized by a pattern of low-intensity rainfall in the winter and cool, dry summers. Fog is a dominant climatic feature, generally occurring frequently during the summer months, and less frequently during the rest of the year. Air temperature is strongly influenced by the extent of the coastal fog belt, which extends inland up to 20 miles or more during summer nights, generally burning off back towards the coast by afternoon. The mean monthly air temperature, measured in the Caspar Creek watershed between 1990 and 1995, ranged from 60° F (15.6° C) in July and August to 44° F (6.7° C) in December (Zeimer 1996). The monthly average maximum air temperature at the same location was 72° F (22.3° C) in July, and the average minimum was 40° F (4.7° C) in December.

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

About 90 percent of the precipitation in this area falls between October and April, with the highest average monthly precipitation in January. Winter storms from the Pacific Ocean bring intense rainfall over several hours or days, particularly warmer storms from lower latitudes. Snow is infrequent and usually does not remain even at higher elevations inland. Mean annual precipitation is 39 inches at Fort Bragg [California Department of Water Resources (CDWR) 1997], but measures higher in the Caspar Creek watershed, where annual means of 51 inches and 45 inches have been recorded at the North and South Fork gages, respectively (Zeimer 1996). Mean annual precipitation at Willits, just a few miles to the east of the JDSF, is slightly higher at 55 inches (CDWR 1997). The rainfall, runoff, and stream discharges in this region are all considerably lower than the wetter redwood forest areas in Humboldt and Del Norte counties to the north.

Topography and Geology[5]

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

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

The California Geological Survey has mapped landslide features and relative landslide potential for the entire Noyo River watershed and for portions of the Big River watershed occupied by JDSF (Manson, Sowma-Bawcom, and Parker 2001; Short and

[5] For extensive information on the topography, geology, and soils setting, see section VII.7 and Appendix 11 of this EIR.

Spittler 2002a; Short and Spittler 2002b). The landslide feature data are summarized in Table V.2. The areas inside and outside of JDSF are generally similar in the percentage of area covered by the various landslide and mass wasting features. Debris slide slopes, followed by rockslides, are the features covering the greatest amount of area. JDSF has a higher percentage of its area in potential inner gorge than does the area outside of the Forest. This situation is of concern because these potentially unstable areas tend to be directly connected to watercourses and have a high likelihood of delivering sediment to watercourses if they release material due to either natural causes or anthropogenic disturbance.

Table V.3 summarizes key road characteristics and estimated sediment production for the cumulative watershed effects assessment area. Road sediment production was estimated using SEDMODL2, as described in Section VII.7. Other factors were estimated using GIS. Overall, road densities for both riparian (within 200 feet of a stream) and nonriparian roads were similar both outside and inside JDSF for the assessment area. The estimated road sediment rate, however, was found to be higher outside JDSF (114.2 tons/per square mile/year) than inside JDSF (96.7 tons/per square mile/year). Extensive discussion of sediment sources, quantities, and impacts can be found in EIR sections VII.6.1, VII.7, VII.10, VIII, and Appendix 11.

The above information on landslide features, relative landslide potential, road sediment generations rates and other road characteristics were developed using remotely sensed data and, in some cases, models that were not field verified in the assessment area. The results of these studies should be used with caution and field verification conducted for on-the-ground project implementation in particular.

Vegetation[6]

Forest dominates the North Coast, Mendocino County, and JDSF. Forest vegetation is a dynamic feature of the landscape, altered by ecological succession processes over time, catastrophic events such as fire or insect outbreaks or landslides, and land management practices that may temporarily alter forest stands (e.g., timber harvest) or more-or-less permanently alter them (e.g., development or agricultural conversion).

Within western Mendocino and Sonoma County, key forest vegetation types include the Redwood Series, Red Alder Series, Pygmy Cypress Series, and the Bishop Pine Series (Sawyer and Keeler-Wolf 1995, Holland 1986). Other relevant vegetation types identified by the California Natural Diversity Database include the following: Northern Coastal Salt Marsh, Coastal Brackish Marsh, Coastal and Valley Freshwater Marsh, Fen, Freshwater Swamp, Coastal Terrace Prairie, Northern Coastal Bluff Scrub, Sphagnum Bog, and Grand Fir Forest.

[6] For extensive information on the vegetation setting, see section VII.6.2 of this EIR.

Table V.2. Percent of Area in Landslides and Other Forms of Mass Wasting for Noyo River, Coastal Planning Watersheds, and Portions of the Big River.

NOYO RIVER	Drainage Area (ac)	Outside of JDSF								Within JDSF							
		Area* (ac)	Debris Flow	Rock Slide	Debris Slide	Earth Flow	Disturbed Ground	Debris Slide Slope	Inner Gorge	Area* (ac)	Debris Flow	Rock Slide	Debris Slide	Earth Flow	Disturbed Ground	Debris Slide Slope	Inner Gorge
NOYO RIVER WATERSHED	72,559	58,476	0.0%	25.1%	0.4%	1.7%	1.0%	24.4%	1.3%	14,084	0.0%	17.5%	0.4%	0.2%	0.1%	30.7%	2.0%
COASTAL WATERSHEDS	25,193	13,224	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	2.3%	11,970	0.0%	1.9%	0.1%	0.0%	0.1%	3.4%	4.7%
BIG RIVER Watershed (Partial)	56,841	34,245	0.0%	1.1%	0.1%	0.4%	0.1%	4.9%	0.2%	22,597	0.1%	7.6%	0.6%	2.7%	0.2%	17.0%	5.2%
AREA TOTAL	154,593	105,945	0.0%	14.2%	0.2%	1.0%	0.6%	15.1%	1.1%	48,651	0.0%	9.1%	0.4%	1.3%	0.1%	17.6%	4.1%

***Note: Percentages are calculated on the basis of the number of acres within each of the respective areas outside of JDSF and inside of JDSF, not on the total drainage area. Totaling percentages for a given area may lead to error since features may be superimposed—e.g., a rockslide may occur on top of an earth flow.**

Source: Manson, Sowma-Bawcom, and Parker 2001; Short and Spittler 2002a

Table V.3. Road Characteristics (from GIS Analysis) and Estimated Sediment Production (from SEDMODL2) for the Cumulative Watershed Effects Assessment Area.

Watershed Unit	Total Drainage Area (mi^2)	Outside of JDSF						Within JDSF						Entire Assessment Area
		Drainage area (mi^2)	Road Miles	Road Density (mi/mi^2)	Miles of Riparian Roads	Riparian Road Density	Road Sediment Rate ($t/mi^2/yr$)	Drainage area (mi^2)	Road Miles	Road Density	Miles of Riparian Roads	Riparian Road Density	Road Sediment Rate ($t/mi^2/yr$)	Road Sediment Rate ($t/mi^2/yr$)
BIG RIVER WATERSHED	181.4	145.9	1,015.5	7.0	420.7	2.9	131.8	35.3	207.6	5.9	137.6	3.9	101.0	107.0
NOYO RIVER WATERSHED	113.0	91.4	679.6	7.4	224.2	2.5	103.5	21.6	110.7	5.1	31.4	1.5	110.6	104.6
COASTAL WATERSHEDS	39.4	20.6	118.5	5.8	45.5	2.2	41.3	18.7	138.9	7.4	51.1	2.7	105.8	71.9
ENTIRE ASSESSMENT AREA	333.5	257.9	1,813.6	7.0	690.4	2.7	114.2	75.6	457.1	6.0	220.1	2.9	96.7	110.2

JDSF has vegetation communities and associations typical of coastal redwood forest in Mendocino County. Most of the redwood stands found on JDSF are young-growth, but several small stands of un-entered and residual old-growth forest remain, totaling approximately 459 acres. There are several uncommon vegetation communities that occur on JDSF. Rare or sensitive vegetation types include the Mendocino pygmy forest, sphagnum bog, wetland, meadow, and grassy opening. Native communities dominate the forest; however, isolated populations of introduced species exist. For example, there is a single eucalyptus plantation located in the Caspar Creek watershed.

The Redwood Series is the principle vegetation type found within JDSF, comprising approximately 48,000 acres. The dominant variation is redwood/Douglas-fir, which covers over half (54 percent) of the Forest (see Section VII-6.2). Other common vegetation types are redwood and Douglas-fir/redwood, each comprising about 15 percent of the area. Stands of pure redwood are uncommon; however, stands in which redwood is the sole dominant tree species include approximately 7,400 acres or 15% of JDSF. The remaining forested vegetation types, in descending order of abundance, are hardwood/redwood, mixed hardwood/conifer, pygmy forest, closed-cone (Bishop) pine/cypress, mixed conifer, and alder. Grassland/bare ground and brush vegetation types together make up less than 1 percent of JDSF.

The Mendocino pygmy forest is a unique ecological community that occurs only in coastal Mendocino County. The California Natural Diversity Database recognizes it as a sensitive plant community. Several individual species that occur in this type are recognized as special status plants. The Pygmy cypress series covers approximately 613 acres of JDSF near the western extent of the Forest. CDF and California State Parks cooperate to manage some of this area.

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

There are currently six invasive exotic plant species that occur within JDSF are on the California Invasive Plant Council (CalIPC) as a List A-1, (most invasive wildland pest plants; widespread). These are pampas grass (*Cortaderia jubata*), Scotch broom (*Cytisus scoparius*), French broom (*Genista monspessulana*), yellow star-thistle (*Centaurea solstitialis*), Himalayan blackberry (*Rubus discolor*), and Tasmanian blue-gum (*Eucalyptus globosus*). The DFMP proposes a number of measures to address these invasive plants.

There are 36 special status plants and lichen that have been identified as being known or likely to occur on JDSF. The plants identified by the standard scoping were refined and supplemented by consultation with Department of Fish and Game Botanist and other sources.

Loss of old growth redwood forest and associated wildlife habitat and other ecological functions has been a significant concern in the redwood region. Within the redwood region, an estimated 95,000 acres of old growth redwood stands remain (Fire and Resource Assessment Program 2003). The vast majority of the remaining old growth redwood is found on public lands. JDSF has about 459 acres of old growth redwood forest, which accounts for about 0.5 percent of the remaining old growth forest in the redwood region. For comparison, Redwood National and State Parks has about 39,000 acres of old growth forest (http://www.nps.gov/redw/faq.html). The JDSF DFMP proposes to protect all old growth redwood stands, as well as individual old growth trees that have defined structural characteristics. The Plan proposes to recruit additional area of late successional forest through a combination of management and let-grow practices. Given the structure and composition, late successional forest is capable of providing some of the wildlife habitat and ecosystem functions of old growth forest.

Wildlife[7]

In western forests, the loss and fragmentation of habitat has generally occurred in landscapes that maintained compositional context in contrast to eastern forests. In other words, in the West, forested patches of varying habitat suitability due to size and juxtaposition remain in a matrix of wildland, versus the relatively more wildlife inhospitable agricultural or urban matrix seen in the East. The relatively limited conversion of western forest land to residential or agricultural uses to date cannot be assumed to continue, as there is a growing demand for large lot first or second home sites within a reasonable driving distance of California's expanding metropolitan population. Western forest landscape patterns also exhibit other differences that can be particularly dynamic given differences in topography and disturbance regimes of various kinds, the complexity of which is compounded by the application of forestry practices. These two landscape conditions also likely differ markedly from eastern forests in their impact on the composition and sustainability of the species populations supported.

It can be assumed that most of the redwood forest in this region was once dominated by old-growth, and subject to periodic disturbances such as fire, flood, wind, and slope failure. The transformation of this forest, through logging, range conversion, and other activities has had a substantial, yet largely unknown, effect, upon habitats and the species that once occupied them.

The redwood/Douglas-fir forest provides habitat for a large number of species. However, with the exception of heavily studied species such as the Northern Spotted Owl, there is only limited information on the role of forest composition and forest patch or stand juxtaposition on population dynamics. Maintaining a forested mosaic that helps support the many species in the region is a goal for both forest management and private forest demonstration. Habitat protection and restoration of relatively rare habitat types is also an important element of forest management.

[7] For extensive information on the wildlife and aquatic resources settings, see section VII.6 of this EIR.

JDSF and the surrounding forested area provides habitat for a number of listed and sensitive fish and wildlife species, including the Northern Spotted Owl, coho salmon, and steelhead. In addition, JDSF currently provides or may provide in the future, habitat for several listed or sensitive species that are not currently known to occur on the forest. These species include the Marbled Murrelet, Pacific fisher, and Humboldt marten. As such, the large block of publicly owned forestland that is JDSF, in conjunction with other parcels of public land in central Mendocino County, represents a valuable resource of potential reoccupancy and sustainability for at-risk wildlife species.

Forest tree size and tree canopy can have a marked influence on the number of wildlife species expected to occur in a forested habitat. Section V.6.6 provides detailed information on vegetation extent by California Wildlife Habitat Relationship System (CWHR) type, size class, and canopy density at the bioregion, county, and Forest levels. Forest structural conditions and species richness provide one basic description of biological diversity. Figure V.2 shows the effects of CWHR size and canopy closure class on the number of wildlife species for both forage and reproduction values. In redwood forest, species richness is typically greatest in those areas where a mosaic of forest development stages is found. Species richness is typically highest in the sparse and open levels of canopy closure (10-39%) in all size classes.

This richness metric must be viewed cautiously, since species preferring forest interior conditions (larger contiguous forested habitat patches and low patch edge to volume ratio) may be negatively affected. The current group of species at risk or of management concern frequently exhibits a preference for interior forest conditions. Although general principles of landscape ecology are available to guide land managers, these preferences are also generally undefined in terms of extent or juxtaposition or appear highly variable when they occur in a forested matrix. Clearly, however, for most or all of these species, unfragmented forests (whose stands may be widely varying in tree diameter and canopy closure) are generally preferred wildlife habitat to forests with interspersed residential, commercial, and highway uses.

Aquatic Resources[8]

JDSF contains parts of 17 planning watersheds, as delineated and defined by CALWATER version 2.2. The proportion of each planning watershed that is part of JDSF ranges from 99 to 1%. To assess cumulative watershed effects (CWE), an assessment area of 32 planning watersheds was identified. The CWE assessment area consists of the Noyo and Big river watersheds, plus the four coastal drainages of Mitchell Creek, Hare Creek, Caspar Creek, and Russian Gulch (Figure V.3). The CWE assessment area totals an estimated 213,731 acres. The CWE assessment area was based on the watershed area that hydrologically influences or is influenced by JDSF.

[8] For extensive information on the aquatic biological resources setting, see sections VII.6.1 and VII.10 of this EIR.

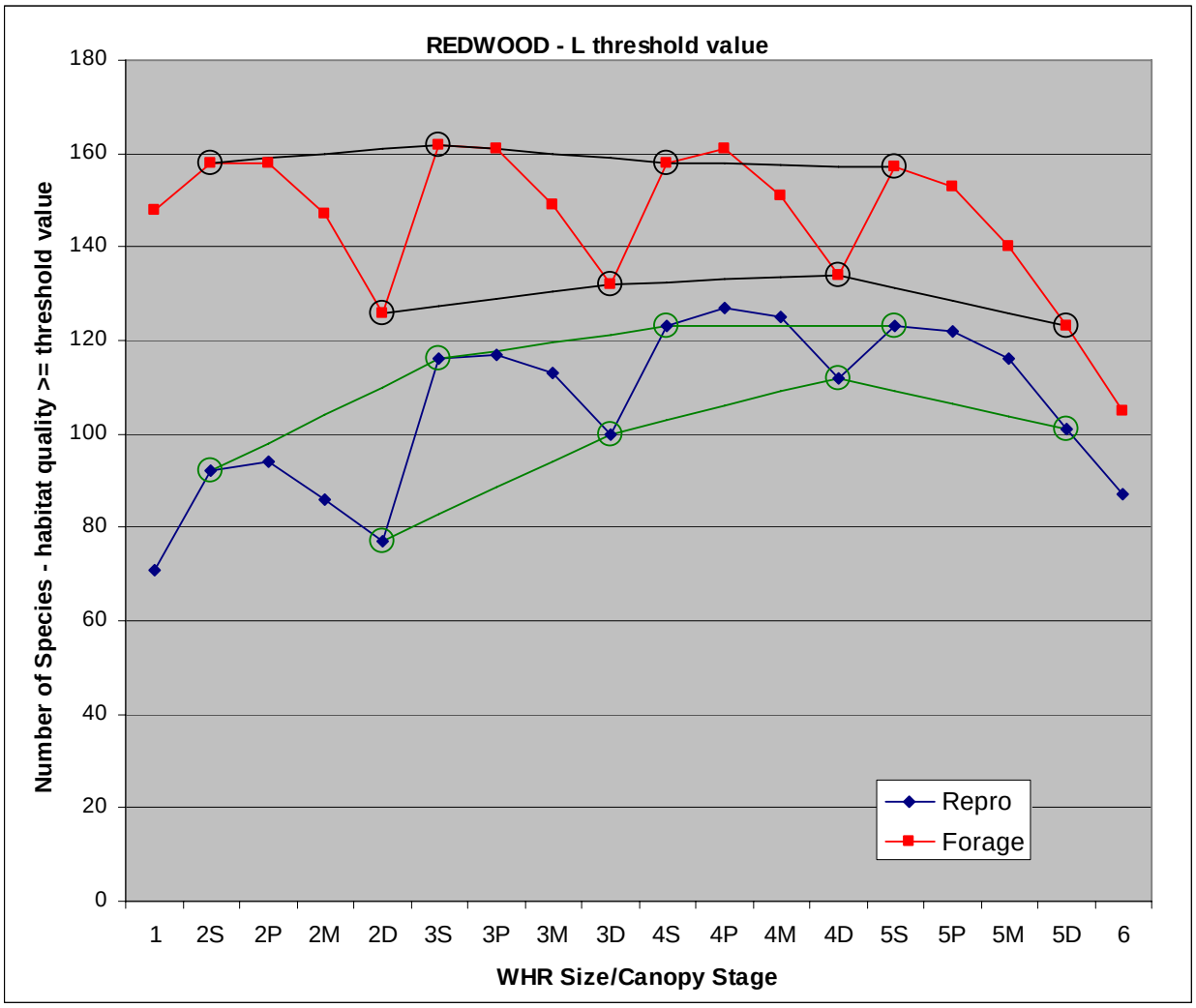

Figure V.2. Effects of CWHR Size and Canopy Closure Class on Number of Wildlife Species.

A legacy of extensive land use activities has left its imprint on the watersheds within the CWE assessment area. These activities include timber harvesting, road building, railroads, and both residential and commercial development. Historic harvesting activities during the period of 1860 to 1940 included the building of a successive series of dams to back up large quantities of water to flush masses of cut logs downstream to sawmills (see Figure V.4). The Big River watershed is documented as having had as many as 27 dams (for excerpts from W. Francis Jackson's book, "Big River was Dammed," and related historical photos, see http://www.krisweb.com/krisbigriver/krisdb/html/krisweb/history/bigdam.htm).

Figure V.3. Cumulative Watershed Effects Assessment Area.

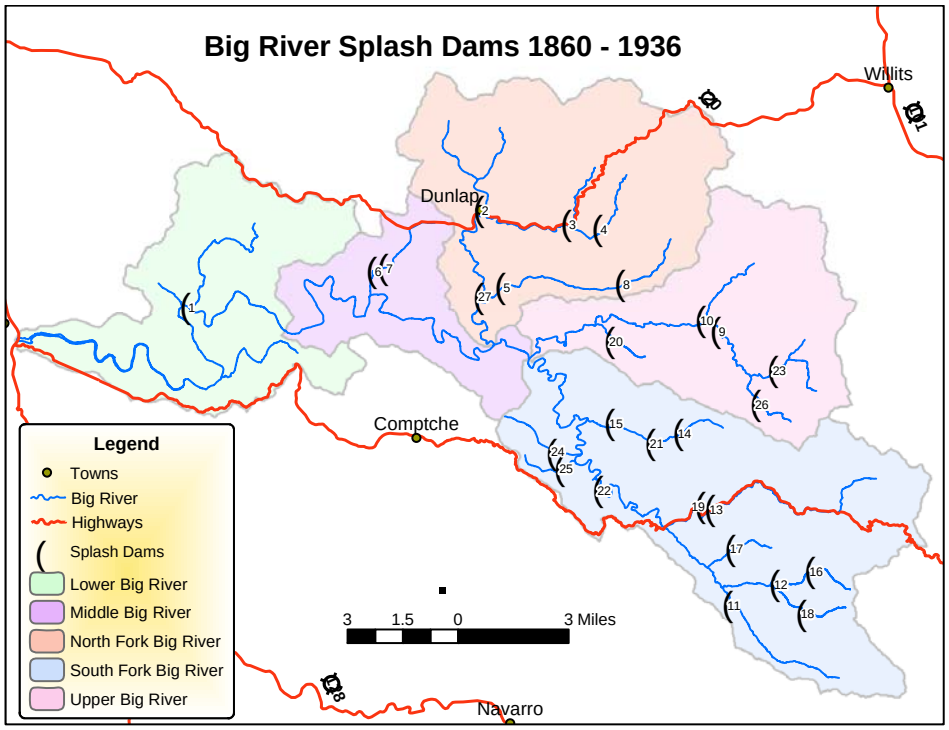

Figure V.4. Splash Dams on the Big River, 1860-1936 (Rutland 2003 adapted from Jackson 1991).

Early logging in this area is characterized by both selective and clearcut harvesting of the old-growth, in which logs were dragged downslope to waterways or railroads located directly within or adjacent to streams. Slopes were commonly burned following tree felling operations, and no erosion control was applied to slopes following completion of logging activity. Subsequent burning was common, in an effort to maintain open range for cattle production. Logging accelerated in the years following World War II, and bulldozers entered the forest, creating excavation of slopes on a massive and unregulated scale. It was not until 1974 that a significant regulatory mechanism was put in place (Z'berg-Nejedly Forest Practice Act). By that time, the vast majority of old-growth forest had been logged, and the industry was being converted to the management and utilization of young-growth trees.

During periods as recent as the 1980s, intensive levels of mostly clearcut logging occurred on a significant area of private lands in the Noyo and Big River watersheds. However, this clearcutting was conducted under the current Forest Practices Act, whereas earlier logging, especially that conducted in the three decades following World War II, was very extensive and mostly unregulated.

The most permanent land use changes within these watersheds have tended to occur at lower elevations near the mouths of the major streams. In these areas, the impacts of rural residential development (e.g. more demand for water pumping, more rapid peak flow runoffs, more daily road use, and more use of yard fertilizers and chemicals,

development within the floodplain) often dominate the overall impact upon the watersheds.

Both the Noyo and Big river watersheds are listed as sediment impaired by the North Coast Regional Water Quality Control Board (NCRWQCB) and have had Total Maximum Daily Loads (TMDLs) established (U.S. EPA 1999 and U.S. EPA 2001, respectively). Big River also is listed as water temperature impaired, but development of the temperature TMDL is not yet scheduled. These sediment and temperature impairments are of particular concern due to the presence of listed salmonid species in these watersheds, specifically, coho salmon and steelhead trout (Figure V.5). These listings of the Big and Noyo river watersheds as impaired are an indicator of existing adverse cumulative effects in these watersheds.

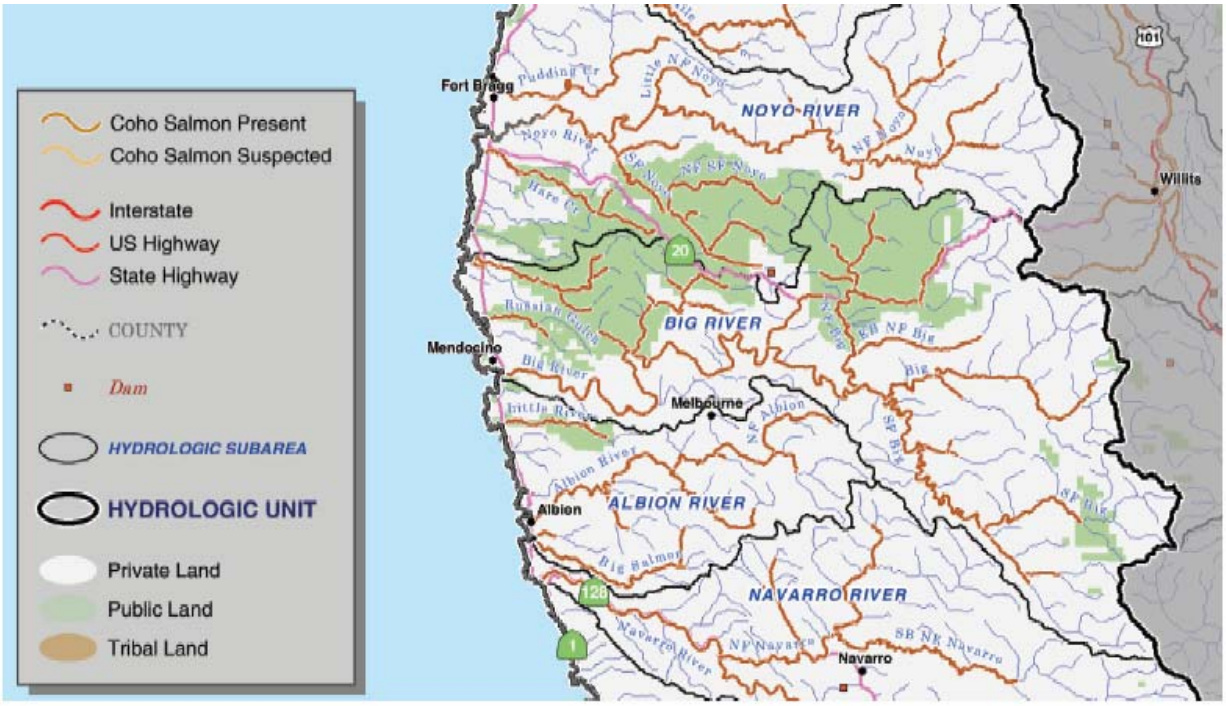

Figure V.5. Coho Presence in the Central Mendocino County Coastal Area. (Source: Image clipped from California Department of Fish and Game 2004.)

As a result of these water quality impairments, permits for new land management activities (but not for ongoing uses such as existing residential or agricultural practices) have been more closely regulated by the North Coast Regional Water Quality Control Board (all land uses and NCRWQCB-permitted activities) and the Department of Forestry and Fire Protection [e.g., special Forest Practice Rules for “threatened and Impaired” watersheds, as promulgated by the Board of Forestry and Fire Protection; see 14 CCR 895.1 (definition for “watersheds with threatened or impaired values”), 916.9, 916.12].

Over the past several decades, forest management practices have evolved in an effort to provide greater protection to watershed resources. In particular, it is now common for logs to be yarded by aerial cable systems, which has vastly reduced the rate of soil excavation once associated with ground-based yarding systems that relied heavily upon road systems constructed on steep slopes and along waterways. In addition to improved management practices and increased regulatory measures to better protect against watershed impairment for sediment, stream temperature, and aquatic habitat, agencies and landowners have been implementing restoration measures to address these factors. The recovery of impacts from historic practices, coupled with the high environmental protection standards of current practices, creates the conditions for an ongoing trajectory of improving aquatic ecosystem conditions.

In addition to natural recovery processes and improved protective practices, there has been a significant investment in restoration activities to improve aquatic ecosystem conditions. Typical restoration measures include reducing sedimentation from existing anthropogenic sources (such as roads), improving fish passage (e.g., by removing or by redesigning and replacing culverts and other road crossings), and enhancing instream habitat (e.g., by placing large woody debris in streams). Some of these restoration efforts are documented in section VIII.2.2 of this report. Table VIII.7 identifies 126 projects that have been implemented in the cumulative watershed effects assessment area since 1990. These efforts have been accomplished with a mixture of private landowner and public agency monies. This list does not capture all the improvement and restoration activities that have been conducted in the cumulative watershed effects assessment area.

JDSF has conducted some restoration efforts (e.g., placement of large woody debris in the Noyo River), however it has been hampered in these activities recently due to budget shortages and staffing limitations associated with legal challenges. The proposed DMFP includes a range of restoration efforts (e.g., a Road Management Plan to inventory all road problems—particularly those related to potential sediment generation and fish passage barriers—establish road repair and removal priorities, and implement repairs and removals over time) and protective practices (e.g., enhanced watercourse and hillslope protections during harvest and development of late seral forests along watercourses). These measures are intended to reduce anthropogenic "background" levels of impacts, as well as to avoid or minimize new potential impacts related to new management activities.

Aerial Photo Sequence

Figures V.6 through V.12 contain photo series that provide a look at how the vegetation on JDSF and neighboring areas has changed over time. The series covers six sites for the years 1942, 1959, 1981, and 2003. Map Figure C provides a locator map for these six sites. These photos begin about five years before the acquisition of JDSF began (see section II) and show the process of vegetation removal and regrowth over time.

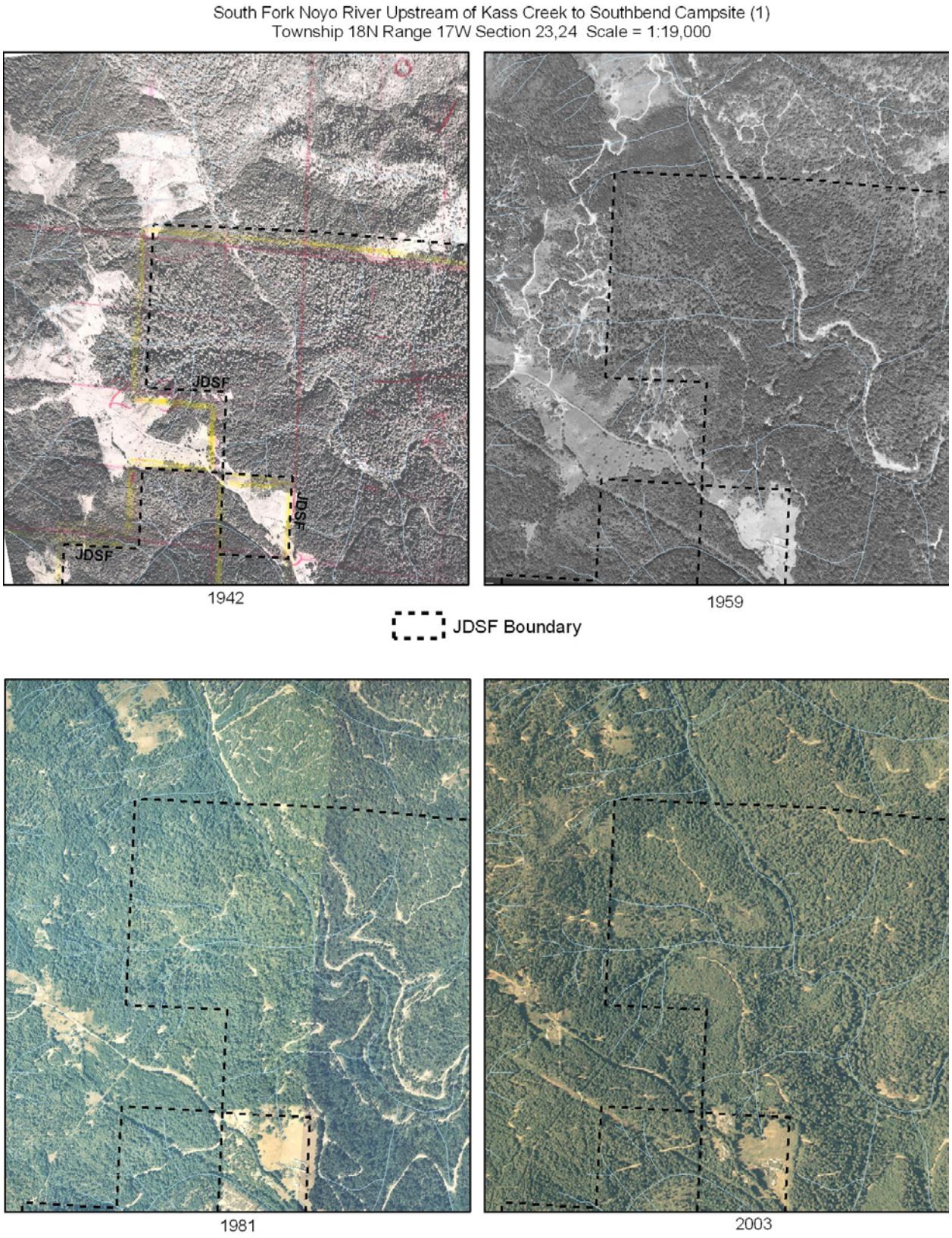

Figure V.6. Photo Sequence 1.

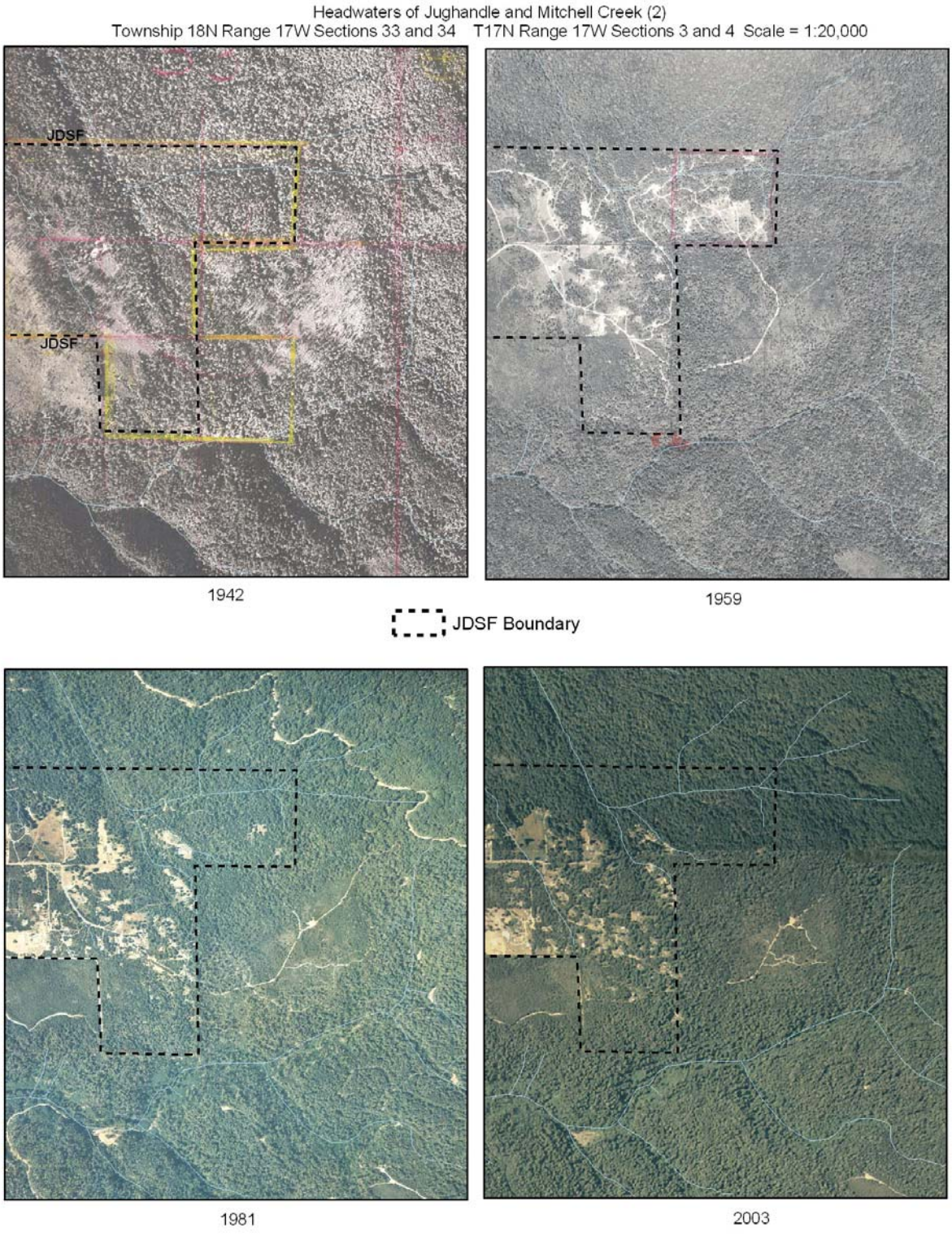

Figure V.7. Photo Sequence 2.

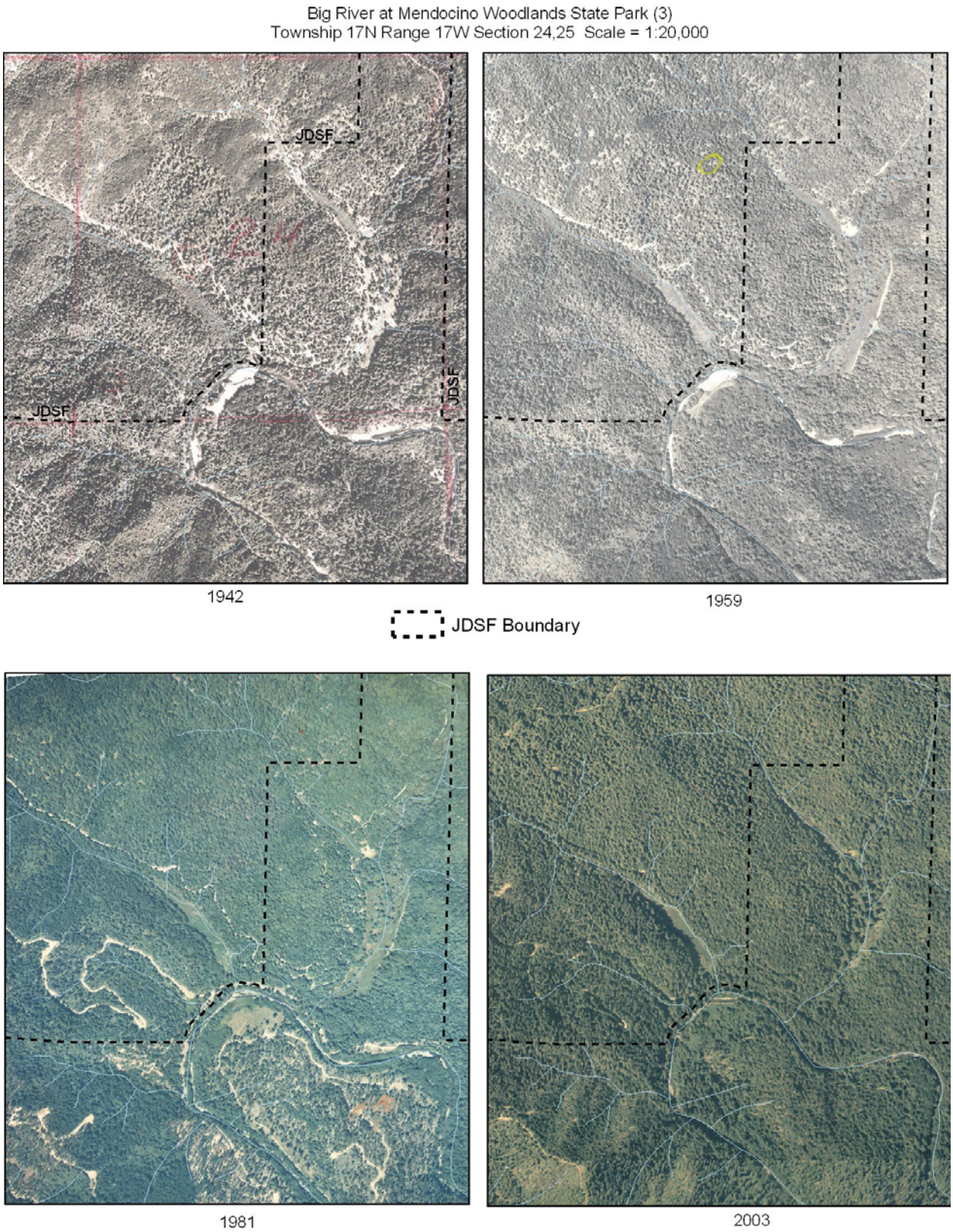

Figure V.8. Photo Sequence 3.

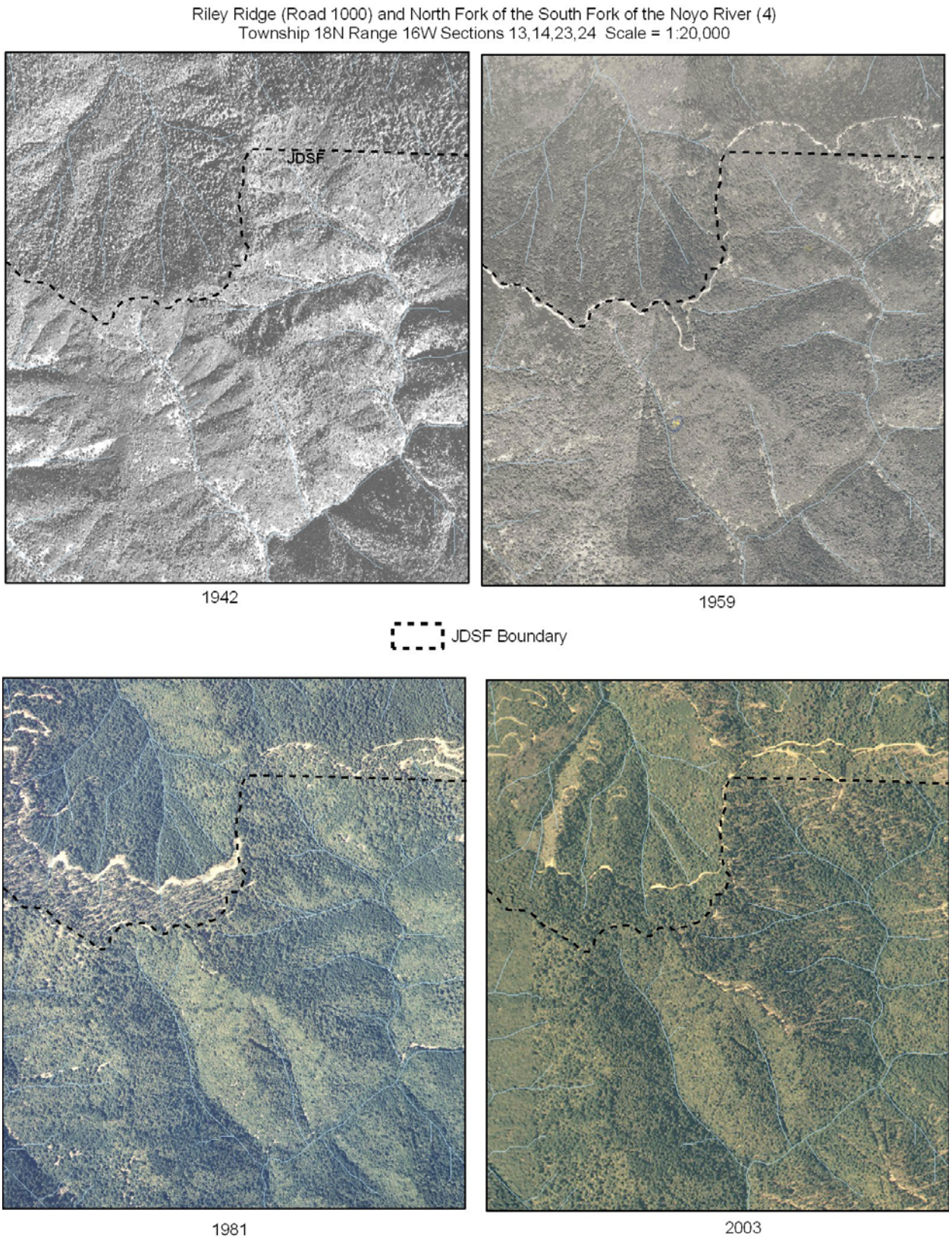

Figure V.9. Photo Sequence 4.

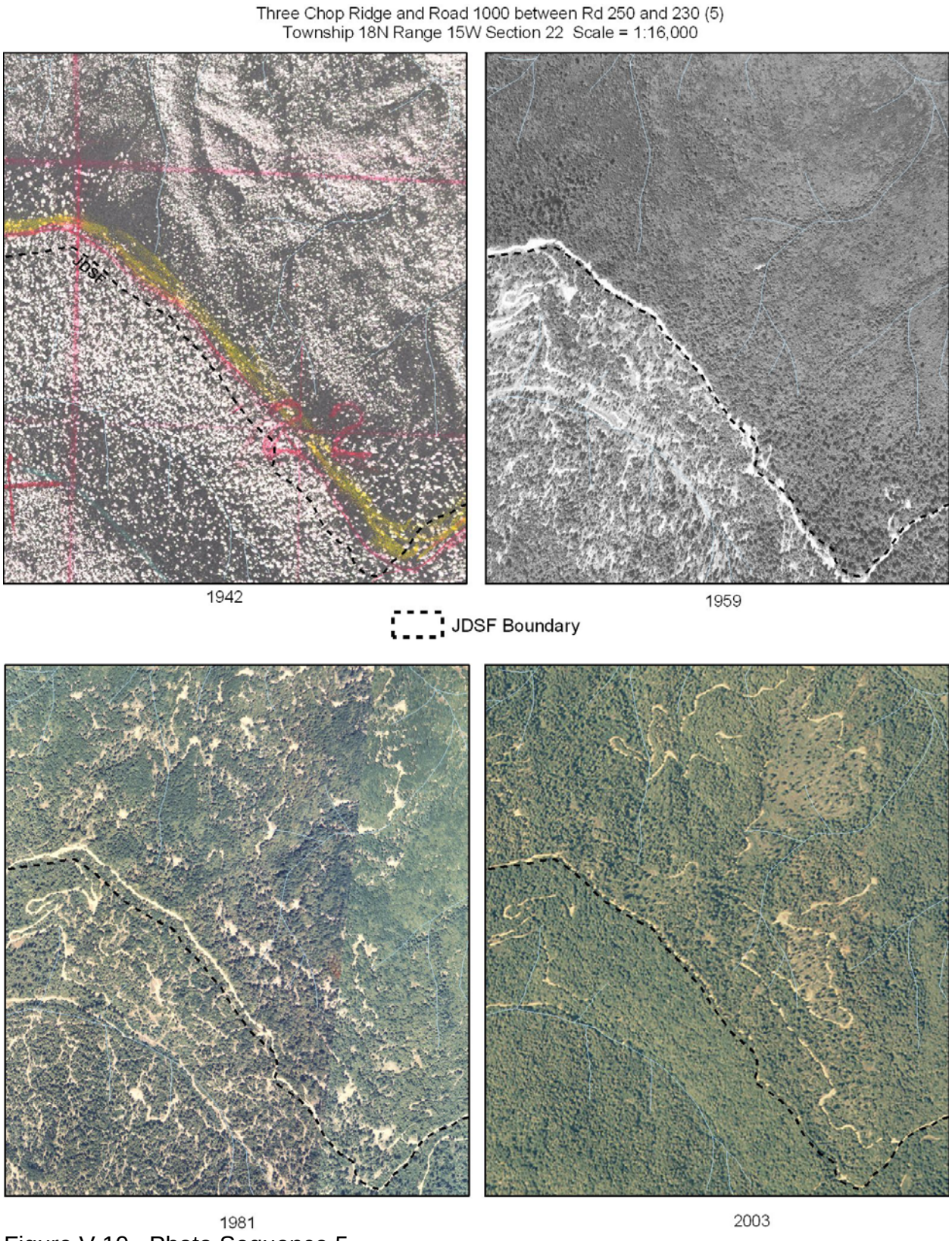

Figure V.10. Photo Sequence 5.

North Fork Big River and Mouth of James CreekRiver (6)
Township 17N Range 15W Sections 2,3,10,11 Scale = 1:22,000

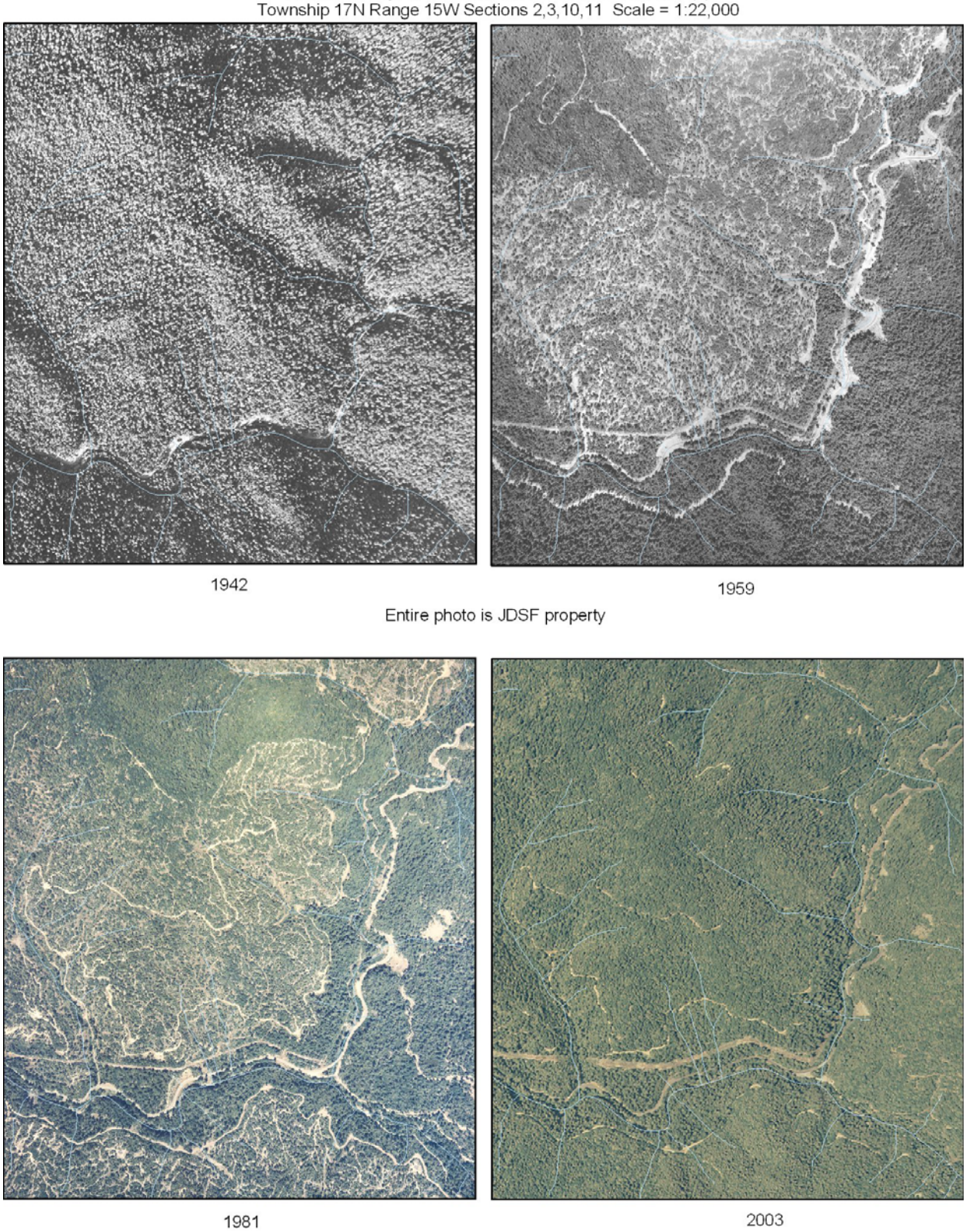

Figure V.11. Photo Sequence 6.

Photo Sequence 1 depicts area in the vicinity of Noyo Hill where the South Fork Noyo River flows northwest from the State Forest. The 1942 photo exhibits the effects of periodic burning and forest conversion for agricultural and range purposes outside of the State Forest. Most of the forest represented in this photo series is second-growth, which grew in response to logging of the old-growth near the turn of the century. In 1959, recent logging of second-growth forest with ground-based skidding equipment is evident adjacent to the State Forest. Note the many skid trails. By 1981, much of the earlier logging area adjacent to the state forest has regrown, and the skid trails are less evident. Note also that the forest conversions (openings) are being reduced in size as the forest encroaches from the perimeter. Finally, the 2003 photograph reflects a continued shrinkage of the conversions, and initiation of even-aged harvesting within the State Forest. Note the patches of lighter green within the State Forest, which are new growth of regeneration.

Photo Sequence 2 depicts area that includes portions of the Mitchell Creek and Jughandle Creek watersheds. Similarly to Photo Sequence 1, the 1942 photo exhibits the effects of recent fires within the pygmy forest area, and most of the surrounding forest is second-growth. By 1959, much of the area adjacent to the State Forest has been developed and residential openings and access roads are readily visible. Evidence of tractor logging exists on the private holdings. By 1981, much of the State Forest area depicted in the photo had been selectively harvested, but substantial regrowth has also occurred. Evidence of roads and landings can be seen in the photo. The private lands exhibit a small increase in cleared or converted area. In the 2003 photo, evidence of timber operations has been obscured by continued growth of the forest. There is also evidence that the density of rural residential dwellings has increased.

Photo Sequence 3 depicts an area near the mouth of the Little North Fork of Big River, in an area where the Mendocino Woodlands State Park, the Big River addition to the Mendocino Headlands State Park, and Jackson Demonstration State Forest meet. In 1942, two types of forest are evident in the photo. Larger trees represent older second-growth that has become established after the old-growth logging that occurred between 1855 and 1910. The more open and brushy areas toward the upper left portion of the photo represent growth of conifer regeneration and brush in area clear-cut logged by the Mendocino Redwood Company during the 1920s. A truck trail is also evident, leading into the Woodlands area. This roadway was constructed by the National Park Service during the 1930s. The 1959 photo depicts continued growth and development of the forest throughout the area. The 1981 photo shows evidence of selective logging of the second-growth forest on lands south of Big River, owned by Georgia-Pacific Corporation at that time, and now part of the Mendocino Headlands State Park. There is also evidence of a truck road constructed in the southern area of the State Forest (Road 720). In 2003, most of the State Forest area exhibits continued growth and development of the second-growth forest, and neither the 1972 or 1997 selective logging near Road 720 is readily evident on the photo.

Photo Sequence 4 depicts area in the vicinity of Three Chop Ridge, which separates the North Fork of the South Fork Noyo River from the main fork of the Noyo River. Jackson Demonstration State Forest is located south of the dividing ridge, and most of the lands north of the ridge belonged to Union Lumber Company in 1942 and to Georgia-Pacific Corporation until about 2000. In the 1942 photo, the area of JDSF exhibits early regrowth of conifer regeneration following clear-cut logging of the early 1900s, followed by periodic burning before 1940. Note the areas where grass has temporarily replaced the conifer forest. To the north, the industrial lands exhibit regrowth following clear-cut logging of the early 1900s. Prior to the 1959 photo, a fire road was constructed along Three Chop Ridge. The surrounding forest exhibits continued growth and development. The 1981 photo exhibits continued forest growth and development, as well as evidence of truck road construction and selective cutting of second-growth forest on the industrial lands. The 2003 photo shows evidence of both selective cutting and clearcutting on the industrial lands. A selective cutting operation on JDSF is also evident in the eastern portion of the photo. Note the straight lines produced by the skyline cable operation.

Photo Sequence 5 depicts an area along Three Chop Ridge where the ridge divides Chamberlain Creek from the main fork of the Noyo River southeast of Northspur. In 1942, the State Forest (south of Three Chop Ridge), then owned by the Caspar Lumber Company, was virgin old-growth forest. The area north of the ridge exhibits a combination of old-growth forest, partially cut old-growth forest, and second-growth. By 1959, the old-growth forest had been selectively cut. Note the development of truck roads, and evidence of many skid trails. Most of the lands outside of JDSF exhibit continued forest growth and development. By 1981, most of the land within the photo has experienced selective cutting. Within JDSF, the cutting was conducted primarily to remove residual old trees, while most of the harvesting on private lands north of the ridge represents selective cutting of second-growth forest. By 2003, the area of JDSF exhibits substantial forest regrowth and development. Most of the skid roads and truck roads have become overgrown or obscured by canopy development. There is limited evidence of even-aged timber harvest on the private lands to the north of the ridge. Note the scattered seed trees toward the upper right area of the photo.

Photo Sequence 6 shows an area of JDSF along Highway 20 in the vicinity of the North Fork of Big River and the mouth of James Creek. In 1942, the only sign of disturbance to the old-growth forest is a narrow roadway along Big River and a very narrow band of second-growth forest along the edges of the river. By 1959, most of the area north of Big River had been logged, with the log skidding conducted by tractors. Note the high density of excavated skid trails, the expanded state highway, and the construction of a power line right of way. The 1981 photo depicts continued harvest of the remaining old-growth forest and remaining residual trees in areas that were previously harvested. The 2003 photo exhibits substantial regrowth of young forest in the area, including revegetation of the skid trails and crown growth over the truck roads. Note the expanded power line clearing.

Recreation and Other Forest Uses[9]

The coastal area of Mendocino County is a popular destination for recreationalists, most of whom visit the area to be close to the beaches. In addition to public beaches and coastline, there are several forested parks available. JDSF provides important public recreational resources, receiving an estimated 61,000 recreational visitors per year.[10] Although approximately 10 million people live within a 5-hour drive of JDSF,[11] most of the recreation activity on the Forest is from Mendocino County residents. There are over 60 individual campsites, many miles of riding and hiking trails, and over 200 miles of forest road utilized by the public. Maintenance of these facilities is an important management component and historically has been funded from timber harvest revenues deposited in the Forest Resource Improvement Fund (FRIF) account. Other common recreational activities conducted on the Forest include picnicking, hunting, swimming, wildlife viewing, and target shooting. The Forest also is a local source of firewood and other minor forest products such as mushrooms and greenery for both personal and commercial use.

JDSF is just one of many public outdoor recreation facilities in the North Coast region. For example, there are over 56 state parks and beaches in this region. These facilities receive an estimated 11 million visitors per year (Department of Parks and Recreation 2003). In Mendocino County alone there are 22 state parks. In the context of public redwood forest recreation opportunities in the state's coastal regions, JDSF represents about 14% of the area and less than 1% of the annual visitation (see Table VII.14.1).

JDSF represents the most significant public land available for mushroom collection in this area. State Parks prohibit the practice of mushroom collection. Universities and mushroom societies from the Bay Area travel specifically to JDSF because of CDF policies allowing the collection of mushrooms.

Regional Conservation Issues

Conservation issues in the California redwood region have been of significant public concern. The many individual issues—including listed species such as salmonids, Northern Spotted Owl, Marbled Murrelet; loss of old growth and late seral forests; land use related sediment impacts to water quality; conversion of timberland to vineyards, residences, and other nonforest land uses; and distribution and kinds of lands available for public access an recreation—all contribute to an overall concern for conservation.

[9] For extensive information on the recreation setting, see sections III.5.5 and VII.14 of this EIR.
[10] CDF considers this visitation estimate very rough due to the lack of controlled entry points, entry fees, or visitor-counting system. Actual numbers could be much higher.
[11] Population information from 2003 California Statistical Abstract, CA Department of Finance, available on the Internet at http://www.dof.ca.gov/HTML/FS_DATA/STAT-ABS/Sa_home.htm.

The Conservation Biology Institute (Strittholt et al. 1999) conducted a somewhat coarse GIS modeling exercise to assess focal areas for redwood ecosystem conservation. Focal areas were examined at a sixth order watershed level for opportunities for long-term maintenance and protection of the redwood ecosystem. The model used nine criteria to assess overall conservation value of the sixth order watersheds. Each criterion was scored on an ordinal scale of 1 to 5, and the results were added to create a composite conservation value score. The nine criteria used were:

- Patch size of late successional forest
- Road density
- Threatened and endangered species
- Concentration of late successional patches
- Forest age composition
- Forest fragmentation
- Proximity to protected areas
- Road and stream interactions
- Forested riparian zones.

The analysis divided the redwood range into three units, northern (Oregon border to southern Humboldt County), central (southern Humboldt County to northern Santa Cruz County, includes JDSF and the surrounding area), and southern (northern Santa Cruz County to the southern border of Monterey County. Each of the three subregions was evaluated separately. The scores were binned into low, medium, high, and very high categories. The top 10 percent of the watersheds that are largely unprotected were identified as being the most important for conservation. Within the central subregion, 25 watershed units were identified as being in the top 10 percent. Only one of these watersheds, Little River, is adjacent to the JDSF cumulative effects assessment area.

Table V.4 presents the results of the Strittholt et al. (1999) study for the planning watersheds within the JDSF cumulative watershed effects (CWE) assessment area. For the CWE assessment area, 39% of the area was rated as low, 38% as medium, and 23% as high. None of these planning watersheds rated in the very high class or among the top 10 percent of the watersheds the report recommended be targeted for conservation efforts. For the area within JDSF itself, 29 percent of the area was rated as low, 51 percent as medium, and 20 percent as high. As compared to the larger CWE assessment area, JDSF had a lower percentage of its area rated as low, a higher percentage rated as medium, and a lower percentage rated as high in redwood ecosystem conservation value.

Based on the information developed by Strittholt et al. (1999) the areas within JDSF and the JDSF CWE assessment area are not among the highest priority areas for redwood ecosystem conservation in the central subregion. None of the area ranks in either the very high category or the top 10 percent of watersheds. However, the results of this study should not be taken to indicate that this area has no significant conservation values for redwood ecosystems. As the various resource analysis components of

Table V.4. Strittholt et al. (1999) Redwood Ecosystem Conservation Ratings for JDSF Cumulative Effects Assessment Area.

Planning Watershed Name	Ranking	JDSF Acres	Percent of Planning Watershed in JDSF Ownership
Big River			
Berry Gulch	M	5,020	63
Chamberlain Creek	L	7,792	99
Dark Gulch	H	0	0
East Branch NF Big River	L	169	3
James Creek	L	3,208	72
Laguna Creek	H	0	0
Leonaro Lake	H	0	0
Lower North Fork Big River	L	2,790	56
Martin Creek	M	0	0
Mettick Creek	L	0	0
Mouth of Big River	H	1,646	17
Rice Creek	L	0	0
Russell Brook	L	0	0
South Daugherty Creek	M	0	0
Two Log Creek	M	544	5
Upper North Fork Big River	M	1,428	26
Noyo River			
Brandon Gulch	M	6,244	97
Duffy Gulch	L	0	0
Hayworth Creek	L	0	0
Kass Creek	M	1,532	43
Little N. Fork	L	12	0
McMullen Creek	M	0	0
Middle Fork N. Fork Noyo River	M	0	0
Mouth of Noyo River	H	22	0
North Fork Noyo River	L	175	3
Olds Creek	L	41	1
Parlin Creek	M	6,058	80
Redwood Creek	M	0	0
Coastal Drainages			
Caspar Creek	H	4,838	90
Russian Gulch	H	1,311	18
Hare Creek	M	4,078	66
Mitchell Creek	H	1,743	27

	Assessment Area		JDSF	
Total Acres and Percent Rated L	84,005	39%	14,187	29%
Total Acres and Percent Rated M	80,212	38%	24,904	51%
Total Acres and Percent Rated H	49,514	23%	9,560	20%

Rankings: L = low; M = medium; H = high, VH = very high (no VH in assessment area).
Source: Rankings from Strittholt et al. 1999, acreages from CDF Fire and Resource Assessment Program GIS.

section VII indicate, JDSF and the surrounding area provide significant fish and wildlife habitat and ecosystems values. The more relevant conservation goals for the demonstration state forest are to demonstrate the practicality of introducing conservation practices that are complementary to ongoing timber management practices on similar private forest lands.

A later report from the Save-the-Redwoods-League and the Bureau of Land Management (2001) presented the results of a series of workshops on North Coast conservation held in 2000 and 2001. The report discussed 11 focus areas for conservation, but did not include any portion of the central Mendocino County watersheds within or adjacent to the JDSF cumulative watershed effects assessment area. The report (p. i) indicated that, “These focus areas were derived through an iterative group process, which involved recording the locations of critical natural resources and current projects on large maps.”

3. SUMMARY

The environmental setting of Jackson Demonstration State Forest has been significantly affected by past land use activities and will continue to be influenced over time by changes in land use in the region. For the forestland ownerships that continue to stay in forest management, many will be rebuilding timber inventories within forests dominated by young growth trees while maintaining a mosaic of forests stands, associated wildlife habitats and substantial watershed protection measures. Many of these ownerships are active in undertaking restoration projects to address legacy impacts to streams and rivers from now abandoned splash dam and road building practices. For some owners, there are increasing concerns over the long-term economic viability of forest management. Combined with the increasing demand for residential parcels in the area, this situation could create significant environmental impacts if currently forested areas are fragmented with conversions to residential and agricultural uses. Within the region, conversions have been concentrated in watersheds closest to the coast in central Mendocino County and around Humboldt Bay. Any acceleration of conversions out of timberland management towards a mix of residential, agriculture, and timberland land uses would have significant environmental impacts for wildlife habitats and water quality metrics that are generally higher for unfragmented landscapes.

Many wildlife species depend on forested conditions within and adjacent to JDSF. Maintaining the forested condition of the landscape matrix in which JDSF is situated will reduce habitat loss and fragmentation resulting from competing land uses and habitat conversion. Marbled Murrelets along the coast of Mendocino, Sonoma and Marin Counties are considered important to future reconnection of murrelet populations in northern and central California. As such, JDSF represents a large block of public land geographically well suited to contribute to the accomplishment of this goal. JDSF provides important aquatic habitat for the support of formally listed coho and steelhead and other amphibian species of concern.

Regional conservation plans have focused on two complementary strategies. One has been the fee purchase of areas for reserve status in specific areas identified as having unique values. The other has been the integration of conservation goals into the management of ongoing forest management operations. The second strategy is more applicable for maintaining large areas of forests in a less fragmented state.